THE

AMERICAN GAS-LIGHT JOURNAL.

THE OFFICIAL GAZETTE OF

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

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THE LENOIR GAS ENGINE.

MOTEUR LENOIR.

(See Engraving on last page.)

The Gas-Power engine, invented by M. Lenoir, of Paris, is now introduced to the American manufacturers, and public at large. The patent for the United States was secured last Autumn, by a gentleman who found the engines in successful and general use in France, and it is believed that its introduction into this country will be an invaluable boon.

M. Lenoir, after several years of experiment, has brought to perfection his gas-power engine, under the auspices of the Imperial Gas-light Company of Paris, and since its first introduction it has been gradually coming into general use in France, until now the French company have a difficulty in keeping pace with the rapidly increasing demand, arising from the multitudinous uses to which it is found to be applicable.

It has recently been introduced into England by the highly respectable firm of Messrs. BARRETT, EXALL & ANDREWES, proprietors of Katesgrove Iron Works, Reading, whose reputation as engineers and machinists is a sufficient guarantee of their opinion of the excellence of the invention, and its adaptation to the mechanical wants of that country.

In a circular addressed to the British public, these gentlemen say: "With a knowledge of all the facts, we "do not hesitate to lend the sanction of our name to "its introduction as a new motive power, into this coun-"try, as we feel convinced it will have an influence "only less powerful than steam already possesses; we "have, therefore, entered into a legal engagement with "the proprietors of the (British) patent, to undertake "the formation, as early as practicable, of a Joint "Stock Company, under the Limited Liability Act. "Under this agreement we are preparing to undertake "the manufacture of the various sizes, which we hope "to be shortly in a position to offer to supply to the "public."

The LENOIR ENGINE is in appearance and style very much like a horizontal steam-engine, having a cylinder, piston, crank-shaft, and fly-wheel; the cylinder has the necessary slide arrangements for the admission of the gas (the ordinary city coal-gas, supplied from the service-pipes) and atmospheric air, in due proportions, which is ignited at the proper moment by the electric spark from a battery connected by wires to each end of the cylinder—the connection being made and detached by the rotary action of the crank-shaft—the expansive force consequent on the ignition, gives motion to the piston on each side alternately. The cylinder has a water-jacket surrounding it, through which a stream of water is kept gradually flowing, to keep it cool.

The engine, once fixed, the battery charged, and the gas turned on, it is ready for action at any desired moment, and as soon as the work required of it is completed, and the gas shut off, the engine instantly stops, and, the expense ceases.

The LENOIR ENGINE is elegant in appearance, simple in construction, absolutely free from danger, either from fire or explosion; it is clean, free from heat, smoke, dust, dirt, or noise; its power is constant or intermittent, as desired, and its expense, when once fixed, is co-existent only with its working.

It is not liable to derangement; in wear and tear the cost is reduced to a minimum sum; the daily expense of gas and chemicals is trifling, while there being no boiler and no chimney, there is no fear of giving annoyance to neighbors. The current of water passing round the cylinder will give a constant supply of warm water, if desired, for other purposes.

No engineer is required to look after it. Once set in motion, it may be left for the day without anxiety, as, should it stop from any cause, no injury can ensue; while the gas-cock, being fixed, and the supply thus regulated, it cannot increase its speed.

It can be worked in any apartment, on any floor—in the cellar or garret, in the hall, a closet, or even in a sitting-room—and under almost any circumstances; in fact, it possesses all the elements to render it a most popular motive power.

The difficulty of obtaining steam-power in central parts of cities is obviated by this engine, which can be fixed and removed at pleasure, quickly and at the least expense.

To GAS COMPANIES it presents no inconsiderable advantages, as not only will it prove a large consumer of gas, but it will require it during the day, a time when there is no other consumption going on.

It is found that the consumption of gas in England is, as near as may be, 70 feet (2 French metres) per horse-power *per hour of actual work*, giving a cost there, with gas at 4s. 6d. sterling per 1,000 feet, of about 4d. (8 cents) per hour.

It has been patented in the following countries:

Austria,	France,	Russia,
Belgium,	Holland,	Spain,
Cuba,	Italy,	United States.
England.	Porto Rico,	

The LENOIR ENGINE is not constructed at present for purposes requiring a greater than 5 horse power (the sizes being ¼-horse, ½-horse, 1-horse, 2-horse, 2½-horse, 3-horse, 4 horse, and 5-horse power), and is therefore specially adapted to small industries, such as carpenters, lathe-turning, sewing machines, hoisting apparatus in warehouses, grain elevators, pumping water in private houses, and hotels (by ¼-horse engines), and in factories of all kinds, hoisting timber and stone for buildings by an engine placed on the sidewalk or beams; distilleries; hotels, for lifting passengers and luggage, and moving washing and drying apparatus, as in the Paris hotels; to glass-cutters, gun-smiths, hydraulic pumps, belting, job printing; driving ventilating fans, printing daily newspapers, propelling city railroad cars, and pleasure yachts; cutting tobacco and box-wood; grinding quartz, paints, and sugar cane; picking hair; sawing, turning, and planing lumber; also, for roasting and grinding coffee, chocolate, corn, &c.; ginning cotton, cutting feed, &c., &c., &c.

The LENOIR GAS ENGINE is in operation in this city, at the brass-cock manufactory of Mr. A. CARR, No. 135 Mercer street, between Houston and Prince streets, where those interested are invited to call and examine it.

THE

LENOIR GAS ENGINE

COMPANY,

Capital—One Million Dollars.

Are prepared to execute orders for Engines of quarter-horse, half-horse, one-horse, two-horse, two-and-a-half-horse, three-horse, four-horse, and five-horse power.

Temporary Office—

No. 11 Broad st. (1st floor), near Wall st.,

NEW YORK.

THE LENOIR GAS ENGINE.—We have been to the Grand Hotel, and examined the five *Moteurs Lenoir* laboring there for the comfort of the thousand travelers lodged in that caravansera of the great world. There is one which supplies the water for the hotel from the cellar to the garret; another raises the dishes from the basement to the fourth story; another turns the machine for breaking the ice, cooling the champagne, and freezing the cream. Six men were formerly required, half naked and panting, to operate this machine, which the little engine turns like a top. Another engine raises to their respective stories the travelers, comfortably seated in a saloon disposed for this perpendicular voyage; another raises the baggage, and all this without noise, without fire, without smoke.

The complaisance of the person in charge of the five Lenoir Engines enabled us to see how quietly they put themselves in operation, and stop themselves instantaneously.

And now what gives to them the movement—what is the source of their power? It is gas, which an electric spark inflames within the cylinder, and drives the piston. It is ordinary coal gas which the immense *Compagnie Parisienne* distributes in all the city. It feeds the Lenoir motor as it would feed a burner or a stove. For hotels and small industries the Lenoir Gas Engine is invaluable.—*French paper.*

NEW METHOD OF ILLUMINATION.—M. Subra, professor of mathematics, has invented a new method of illumination, or rather a method of inverting a flame, by the adoption of which several advantages are expected to be realized. The apparatus consists of a syphon of glass, the open ends of which are turned upwards; a burner is placed just within the shorter branch. Before lighting the lamp, the longer branch of the syphon is heated, and a current of air established, which carries with it any flame placed at the open end of the shorter branch, the flame, consequently, becoming inverted. As soon as the current is established, and the burner kindled, the heating of the longer leg may be discontinued, the current, once established, being sustained by the heat from the inverted flame. The advantages of this new arrangement are as follows: The supports of the globes or lamp-glasses are placed above the flame, and do not intercept the light; the reflectors, also, are in no danger of becoming blackened by smoke, and they collect rays that otherwise would be lost in the air. The flame has a more elevated temperature on account of the heat being concentrated by the syphon, and the carbon consequently more incandescent. The products of combustion are collected in the syphon, and may be conveyed away, instead of vitiating the air of the apartment. It is proposed to employ these reversed flames as foot-lights for theatres, the advantages, such as safety, &c., being obvious.

PATENT FISHING LAMP.—A Mr. Fanshaw, of England, has invented a patent lamp for fishing, which is thought by practical fishermen to be of great value. It is a well-known fact that light has a great attraction for fish, and that fishermen therefore use it to allure them toward their nets. But these have always been placed on the top of the boats. By Mr. Fanshaw's invention, a lamp can be let down some twelve feet or more into the water, and so allure the fish to a greater depth than has hitherto been practicable. A short description of this invention may not prove, perhaps, uninteresting to our readers.

GAS-LIGHT COMPANIES IN THE UNITED STATES.

Compiled from official sources expressly for the AMERICAN GAS-LIGHT JOURNAL.

CORRECTED BY JOHN B. MURRAY & CO., No. 11 BROAD STREET, NEW YORK, SHARE BROKERS.

When Chartered.	Town.	State.	Chartered Capital.	Par Val. Per Sh. $	Semi-Ann'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS
1857	ADRIAN	Mich.	50,000	50	—	May & November.	4,000	3 50	....	....	
1856	AKRON	O.	20 000	33⅓	—	Do.	3,500	3 00	....	....	
1845	ALBANY	N. Y.	250, 00	20	4	January & July.	65,000	3 00	120	....	None in market.
1858	ALBION	N. Y.	30,000	100	—	Do.	3,000	3 80	....	....	
1851	ALEXANDRIA	Va.	106,530	—	—	City Works.	9,000	3 50	....	....	
1852	ALLEGHANY	Pa.	200,000	25	4	May & November.	25,000	3 00	....	....	
1853	ALLENTOWN	Pa.	60,000	100	3½	Do.	5,000	3 50	....	....	
1857	ALTON	Ill.	75,000	—	—	Private Works.	4,000	3 50	....	....	
1859	ALTOONA	Pa.	40,000	20	4	January & July	5,000	3 00	....	....	
1859	AMESBURY AND SALISBURY	Mass.	30,000	25	—	Do.	7,000	4 00	....	....	
1858	ANNAPOLIS	Md.	100,000	25	—	Do.	4,000	4 00	....	....	
1858	ANN ARBOR	Mich.	23,000	50	5	March & September.	5,500	4 00	....	....	
1858	ASTORIA	N. Y.	20,000	50	—	Do.	6,000	4 00	....	....	
1855	ATLANTA	Ga.	50,000	25	5	January & July.	12,000	5 00	....	....	
1857	ATTLEBORO'	Mass.	6,000	50	3	Do.	2,000	6 00	....	....	
1850	AUBURN	N. Y.	80,000	50	5	Do	10,000	7 00	....	....	
1851	AUGUSTA	Ga.	80,000	25	8	Do.	9,000	6 00	....	....	
1853	AUGUSTA AND HALLOWELL	Me.	84,700	50	5	Do.	10,000	4 00	....	....	
1860	AURORA	Ind.	10,000	—	—	Private Works.	3 500	3 50	....	....	Formerly used Sanders' Water-Gas. Recently altered to Coal Gas-Works.
1817	BALTIMORE	Md.	550,000	100	5	June & December.	150,000	2 50	150	....	None for sale.
1852	BANGOR	Me.	120,000	100	2½	January & July.	12,000	3 00	100	....	
1855	BATAVIA	N. Y.	32,000	20	4	Do.	2,500	4 00	100	100	Stock firm. Good works and well managed.
1853	BATH	Me.	65,000	100	3	April & October.	10,000	3 75	....	....	
1859	BATH	N. Y.	15,000	50	—	May & November.	3,000	7 00	....	....	
1861	BATTLE CREEK	Mich.	15,000	—	—	January & July.			....	....	
1858	BELFAST	Me.	14,000	100	—	Do.	7,000	7 00	....	....	
1856	BELLEFONT	Pa.	20,000	25	2	Do.	3,500	4 00	....	....	
	BELOIT	Wis.	30,000	—	—	Do.	4,000	4 00	....	....	
1854	BETHLEHEM	Pa.	50,000	50	4	June & December.	2,000	3 20	....	....	
1859	BEVERLY	Mass.	40,000	100	—	January & July.	4,000	4 00	....	....	
1853	BINGHAMPTON	N. Y.	50,000	50	3½	Do.	10,000	4 00	....	....	
1859	BIRMINGHAM	Pa.	40,000	50	—	Do.	4,000	4 00	....	....	
1855	BLOOMINGTON	Ill.	40,000	50	—	Do.	6,000	4 00	....	....	
1853	BORDENTOWN	N. J.	50,000	25	3	June & December.	4,000	3 80	....	....	
1822	BOSTON	Mass.	1,000,000	500	5	Do.	130,000	2 50	....	....	
1859	BRATTLEBORO'	Vt.	21,000	—	—	Do.	3,000	4 00	....	....	
1851	BRIDGEPORT	Ct.	90,000	25	4	January & July.	10,000	4 00	90	....	Passed last dividend.
1857	BRIDGETON	N. J.	50,000	20	—	Do.	5,000	4 00	....	....	
1856	BRISTOL	Pa.	30,000	25	3	February & August.	3,000	4 00	....	....	
1855	BRISTOL	R. I.	35,000	50	2	January & July.	6,000	4 00	....	....	
1859	BROCKPORT	N. Y.	25,000	100	3	Do.	1,500	4 00	....	....	
1853	BROOKLINE	Mass.	77,000	100	4	February & August.	3,500	3 50	....	....	
1825	BROOKLYN	N. Y.	2,000,000	25	5	January & July.	75,000	2 50	170	169	
	BROWNSVILLE	Pa.				Do.			....	....	
1848	BUFFALO	N. Y.	600,000	50	5	Do.	70,000	2 90	140	125	
1852	BURLINGTON	N. J.	100,000	25	3½	Do.	5,000	4 00	105	....	
1853	BURLINGTON	Vt.	75,000	25	2½	Do.	10,000	4 50	....	....	
1859	BURLINGTON	Iowa.	65,000	50	—	Do.	8,000	4 00	....	....	
1861	CALAIS	Me.	90,000	100	—	Do.	10,000	3 50	....	....	
1852	CAMBRIDGE	Mass.	300,000	100	5	February & August.	20,000	3 50	100	97½	
1852	CAMDEN	N. J.	300,000	100	3	April & October.	15,000	3 85	105	100	
1853	CANANDAIGUA	N. Y.	50,000	50	—	January & July.	3,000	4 00	90	80	
1856	CANTON	O.	19,000	50	6	March & September.	6,000	3 00	....	....	
1853	CAPE ISLAND	N. J.	80,000	100	—	October.	10,000	6 00	....	....	Watering place.—These Works only run in summer.
1860	CARBONDALE	Pa.	16,000	25	—	March & September.	5,000	4 00	....	....	
1855	CARLISLE	Pa.	30,000	25	—	January & July.	4,000	4 00	....	....	
1856	CATASAUQUA	Pa.	15,000	25	5	May & November.	2,000	4 00	....	....	
1858	CATSKILL	N. Y.		—	—	Private Works.	3,000	3 00	....	....	Owned by G. T. Sutton.
1857	CHAMBERSBURG	Pa.	30,000	25	—	January & July.	3,000	4 00	....	....	
1846	CHARLESTON	S. C.	723,800	25	4	Do.	50,000	4 00	....	....	
1851	CHARLESTOWN	Mass.	200,000	50	4	Do.	30,000	3 00	....	....	
1858	CHARLOTTE	N. C.	14,000	50	10	March & September.	3,500	6 00	....	....	
1859	CHARLOTTEVILLE	Vt.	15,000	25	—	Do.	4,000	4 50	....	....	
1851	CHELSEA	Mass.	100,000	100	3½	January & July.	8,000	3 50	....	....	
1856	CHESTER	Pa.	35,000	25	3	April & October.	4,000	4 00	....	....	
1849	CHICAGO	Ill.	1,300,000	25	5	January & July.	100,000	2 50	150	140	Very scarce. Stock wanted.
1857	CHICOPEE	Mass.	50,000	20	—	Do.		4 00	....	....	
1851	CHILLICOTHE	O.	40,000	25	4	Do.	12,000	3 50	....	....	
1841	CINCINNATI	O.	1,600,000	100	5	Do.	225,000	2 50	....	....	
1859	CITIZENS', BROOKLYN	N. Y.	1,000,000	20	—	Do.	135,000	3 00	128	125	
1860	CITIZENS', READING	Mass.	90,000	100	—				....	....	
	CLARKESVILLE	Tenn.	100,000	50	—	Do.	5,000	4 00	....	....	
1860	CLAREMONT	N. H.	20,000	100	—	March & September.	3,000	4 00	....	....	
1846	CLEVELAND	O.	200,000	10	5	January & July.	20,000	3 00	....	....	
1858	CLINTON	Mass.	30,000	500	5	Do.	3,000	4 00	....	....	
1859	CLYDE	N. Y.	10,000	50	4	Do.	2,500	4 00	....	....	
1854	COHOES	N. Y.	50,000	20	3½	April & October.	5,000	3 60	....	....	
1860	COLD SPRING	N. Y.	30,000	50	—	Do.	3,500	4 00	95	....	Formerly Rosin-Gas, but now Coal. A well managed company. Stock firmly held.
1860	COLD WATER	Mich.	25,000	50	5	January & July.	4,000	4 00	....	....	
1852	COLUMBIA	Pa.	37,500	25	—	Do.	4,000	3 50	....	....	
1852	COLUMBIA	S. C.	44,000	25	4	Do.	6,000	6 00	....	....	
1857	COLUMBIA	Cal.	50,000	25	—	Do.	4,500	10 00	....	....	
1853	COLUMBUS	Ga.	54,000	25	5	Do.	5,000	7 00	....	....	
1850	COLUMBUS	O.	100,000	10	6	Do.	30,000	3 00	....	....	
1853	CONCORD	N. H.	50,000	50	5	Do.	8,000	3 50	....	....	
1853	COVINGTON AND NEWPORT	Ky.	100,000	50	3½	Do.	28,000	4 00	....	....	
1854	CUMBERLAND	Md.	60,000	50	3	Do.	6,000	4 00	....	....	
1857	DANBURY	Ct.	50,000	25	4	Do.	2,000	3 75	....	....	
1856	DANVILLE	Pa.	30,000	25	—	June & December.	3 000	4 00	....	....	
1855	DAVENPORT	Iowa.	56,000	100	—	Do.	6,000	5 00	....	....	
1848	DAYTON	O.	50,000	25	5	February & August.	8,000	3 50	....	....	
1853	DEDHAM	Mass.	40,000	50	—	January & July.	3,000	4 00	....	....	
1860	DELAWARE	O.	30,000	25	—	Do.	2,500	3 00	....	....	
1849	DETROIT	Mich.	500,000	50	5	Do.	30,000	3 50	160	150	
1860	DOBBS' FERRY	N. Y.	25,000	—	—	Do.	3,000	4 00	....	....	Excellen tock. No sales.
1854	DORCHESTER	Mass.	150,000	100	—	Do.	14,000	4 00	....	....	
1859	DOVER	Del.	12,000	—	—	Private Works.	2,000	4 00	....	....	
	DOVER	N. H.				January & July.			....	....	
1857	DOYLESTOWN	Pa.	50,000	—	—	Do.	3,000	4 00	....	....	
1854	DUBUQUE	Iowa.	50,000	115	3½	Do.	17,000	4 50	....	115	This stock is wanted at par.
1853	EAST BOSTON	Mass.	133,000	25	4	Do.	20,000	3 50	....	145	
1858	EAST GREENWICH	R. I.	11,200	100	15	Do.	3,000	7 00	....	....	No transactions.
1861	EAST HAMPTON	Mass.	10,000	25	—	Do.	5,000	9 00	....	....	
1861	EAST NEW YORK	N. Y.	50,000	50	—	Do.	12,000	3 50	....	....	
1857	EASTON	Md.	9,000	10	—	Do.	1,500	7 00	....	....	
1850	EASTON	Pa.	125,000	50	4	June & December.	6,000	3 60	....	....	
1856	EASTPORT	Me.	50,000	55	—	Do.	3,000	4 00	....	....	
1855	ELIZABETH	N. J.	100,000	20	4	January & July.	14,000	3 50	....	....	
	ELLICOTT'S MILLS	Md.	10,000	—	—	Do.	4,000	4 00	....	....	
1852	ELMIRA	N. Y.	50,000	25	3½	Do.	5,000	4 00	....	....	
1852	ERIE	Pa.	68,000	50	3½	June & December.	10 000	3 00	....	....	
1833	EVANSVILLE	Ind.	60,000	50	4	January & July.	12,000	4 00	110	....	
	EXETER	N. H.	60,000	—	—	Do.	12,000		....	....	A very good Company.
	FAIR HAVEN	Ct.	20,000	25		Do.	8,000	4 00	....	....	
1847	FALL RIVER	Mass.	26,000	—	—	Private Works.	12,000	3 50	....	....	
1859	FAYETTEVILLE	N. C.	25,000	100	6	January & July.	7,000	6 00	....	....	
	FIFTH WARD (Milwaukee)	Wis.	50,000	25	—	Do.	10,000	4 00	....	....	
1857	FISHKILL	N. Y.	10,000	20	—	April & October.	1,500	9 00	....	....	
1853	FITCHBURG	Mass.	100,000	50	3	January & July.	5,000	4 00	....	....	Make Petroleum-Gas.
1859	FLEMINGTON	N. J.	20,000	—	—	Do.	3,000	4 00	....	....	
1855	FLUSHING	N. Y.	20,000	50	1½	March & September.	6,500	4 00	....	....	
1858	FOLSOM	Cal.							....	....	
	FORT WAYNE	Ind.	40,000	25	—	Do.	6,000	4 00	....	....	
1851	FRANKFORT	Ky.	50,000	—	—	City Works.	5,500	4 50	....	....	
1851	FREDERICK CITY	Md.	36,000	100	—	January & July.	5,000	6 70	....	....	
1854	FREDERICKSBURG	Va.	72,500	50	5	Do.	4,500	4 00	....	....	
1858	FREDONIA (Natural Gas)	N. Y.	10,000	100	—	Do.	2,000	4 00	....	....	Unlimited supply of Natural Gas.
1856	FREEPORT	Ill.	20,000	100	—	May & November.	10,000	4 00	....	....	

GAS-LIGHT COMPANIES IN THE UNITED STATES.—Continued.

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When Chartered.	Town.	State.	Chartered Capital.	Par Val. Per Sh. $	Semi-Ann'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1859	Fremont	O.	25,000	25	—	May & November.	2,000	4 50	....	....	
1858	Fulton	N. Y.	12,000	100	—	Do.	4,000	7 00	....	....	
1855	Galena	Ill.	70,000	100	—	Do.	8,000	4 00	....	....	
1859	Galion	O.	25,000	25	—	January & July.	1,800	3 00	....	....	
1858	Galveston	Texas.	150,000	50	—	May & November.	7,000	6 00	....	....	
1854	Gardiner	Me.	100,000	50	4	Do.	8,000	4 00	....	....	
1853	Geneva	N. Y.	75,000	25	2½	Do.	6,000	4 00	....	....	
1851	Germantown	Pa.	Merged	into	the	Philadelphia Works.	12,000	2 25	....	....	
1859	Gettysburg	Pa.	20,000	50	3	January & July.	2,500	4 00	....	....	
1854	Glenn's Falls	N. Y.	35,000	50	3	February & August.	4,000	4 00	....	....	
1854	Gloucester	Mass.	40,000	50	—	January & July.	5,000	3 50	....	....	
1857	Gloversville	N. Y.	15,000	25	—	Do.	3,000	3 50	....	....	
1858	Grand Rapids	Mich.	50,000	20	—	Do.	3,000	4 00	....	....	
1855	Great Barrington	Mass.	5,000	100	5	April & October.	2,000	7 00	....	....	
1849	Great Falls	N. H.	50,000	100	3	Do.	3,000	4 00	....	....	
1860	Greenfield	Mass.	20,000	50	2	January & July.	2,500	4 00	....	....	
1853	Greenpoint	N. Y.	100,000	50	5	Do.	20,000	3 00	....	....	Close corporation.
1859	Greensboro'	N. C.	12,000	50	—	April & October.	3,000	7 00	....	....	
1858	Greensburg	Pa.	30,000	25	3	May & November.	2,000	3 00	....	....	
1854	Hagerstown	Md.	15,000	20	—	January & July.	2,000	6 00	....	....	
	Hamilton	O.	15,000			Do.			....	....	
1859	Hannibal	Mo.	100,000	100	—	Do.	6,000	3 50	....	....	
1857	Harlem	N. Y.	350,000	50	3½	Do.	25,000	3 00	....	145	
1855	Harrisburg	Pa.	100,000	—	4	Do.	5,000	4 00	....	....	
1849	Hartford	Ct.	200,000	25	4	Do.	25,000	3 00	150	140	Stock in demand.
	Hastings	N. Y.				Do.	8,000	4 00	....	....	
1853	Haverhill	Mass.	50,000	50	—	Do.	5,000	4 00	....	....	
1859	Haverstraw	N. Y.	20,000	100	—	Do.	5,000	4 00	....	....	
1861	Hayesville	Mass.	15,000	25	—	Do.	4,000	4 00	....	....	
1859	Hempstead	N. Y.	16,000	25	—	Do.	1,000	4 00	....	....	
1862	Hoboken	N. J.	100,000	25	3	Do.	30,000	2 50	....	100	Works not yet built.
1856	Hollidaysburg	Pa.	30,000	25	2	Do.	4,000	3 50	....	....	
1861	Holyoke	Mass.	20,000	25	—	Do.	3,000	4 00	....	....	
1861	Homer & Cortlandt	N. Y.	40,000	100	—	Do.	6,000	4 00	....	....	
1854	Honesdale	Pa.	30,000	25	3	Do.	2,500	4 00	....	....	
1860	Hornellsville	N. Y.	12,000	50	—	Do.	2,000	4 00	....	....	
1858	Hudson	N. Y.	50,000	100	3½	February & August.	3,000	4 00	....	....	
	Hunter's Point	N. Y.									
1857	Huntington	Pa.	18,000	50	3	Do.	2,000	3 50	....	....	
1856	Huntsville	Ala.	7,325	25	—	June & December.	2,000	5 00	....	....	
	Indianapolis	Ind.	150,000	—	—	Do.	15,000	5 00	....	....	
1857	Iowa City	Iowa.	40,000	50	—	February & August.	4,000	4 50	....	....	
1852	Ithaca	N. Y.	75,000	25	3½	January & July.	6,000	4 00	....	....	
1857	Jackson	Mich.	25,000	50	5	Do.	6,000	3 50	....	....	
	Jackson	Miss.	80,000	50	—	Do.	4,000	4 50	....	....	
	Jackson	Cal.	50,000	30	—	Do.	4,000	10 00	....	....	
	Jacksonville	Flor.	30,000	20	—	Do.	2,000	7 00	....	....	
	Jacksonville	Ind.	50,000	50	—	Do.	4,000	5 00	....	....	
1858	Jacksonville	Mo.	25,000	25	—	Do.	7,000	6 00	....	....	
1856	Jamaica	N. Y.	20,000	—	4	Do.	6,000	4 00	....	....	
1853	Jamaica Plain	Mass.	78,000	100	3	Do.	3,000	3 00	....	....	
	Jamestown	N. Y.	25,000	—	—	Do.	4,000	4 00	....	....	
1856	Janesville	Wis.	50,000	100	—	Do.	12,000	4 00	....	....	
	Jeffersonville	Md.	30,000	25		Do.	4,000	4 00	....	....	
1853	Jersey City	N. J.	300,000	—	5	Do.	30,000	3 00	150	....	No sales since formation of Hoboken Co.
1858	Jersey Shore	Pa.	15,000	25	—	Do.	2,000	3 70	....	....	
1856	Johnstown	Pa.	80,000	25	3	Do.	8,000	3 00	....	....	
1857	Joliet	Ill	300,000	100	—	June & December.	6,000	4 00	....	....	
1858	Kalamazoo	Mich.	30,000	50	5	Do.	10,000	4 00	....	....	
1860	Keene	N. H.	60,000	100	—	Do.	4,500	4 00	....	....	
1855	Keokuk	Iowa.	100,000	100	—	January & July.	10,000	4 50	....	....	
1855	Kingston	Pa.	50,000	50	—	Do.	3,000	4 00	....	....	
1859	Kittanning	Pa.	20,000	—	—	Doubtful.	5,000	4 00	....	....	Said to be a fraud.
1854	Knoxville	Tenn.	63,000	—	—	April & October.	4,000	5 00	....	....	
1860	Laconia	N. H.	20,000	100	—	Do.	4,000	6 00	....	....	
1859	La Crosse City	Wis.	100,000	50	—	June & December.	10,000	8 00	....	....	Petroleum and Wood Gas.
1854	Lafayette	Ind.	60,000	50	4	January & July.	10,000	3 25	....	....	
1856	Lambertville	N. J.	30,000	25	—	Do.	2,500	4 00	....	....	
1849	Lancaster	Pa.	100,000	50	4	Do.	10,000	3 00	....	....	
1856	Lancaster	O.	25,000	100	5	Do.	5,000	3 50	....	....	
1855	Lansinburg	N. Y.	25,000	100	—	Private Works.	7,000	4 00	....	....	
1849	Lawrence	Mass.	200,000	100	4	February & August.	15,000	3 50	....	....	
1859	Leavenworth	Kansas.	200,000	25	—	Private Works.	15,000	4 00	....	....	
1856	Lebanon	Pa.	26,000	50	—	February & August.	5,000	4 00	....	....	
1861	Le Roy	N. Y.	25,000	50	—	Do.	4,000	4 00	....	....	
1858	Lewisburg	Pa.	20,000	100	—	January & July.	4,000	4 00	....	....	
1852	Lewiston	Me.	100,000	100	3	Do.	10,000	3 20	....	....	
1856	Lewistown	Pa.	80,000	50	3	April & Octobe	3,000	3 10	....	....	
1853	Lexington	Ky.	100,000	25	4	January & Jul	5,000	4 00	....	....	
1853	Little Falls	N. Y.	112,000	25	—	Do.	3,500	7 00	....	....	
1861	Little Rock	Ark.	20,000	—	—	Do.	5,000	6 00	....	....	
1858	Lockhaven	Pa.	28,000	—	—	Do.	3,000	4 00	....	....	
	Lockport	N. Y.	100,000	50	—	Do.	4,000	4 00	....	....	
	Logansport	Ind.	40,000		5	April & October.	5,000	4 00	105		But $481,400 stock has been sold. This Company has a large contingent fund and undivided profit on hand.
1838	Louisville	Ky.	600,000	50	6	January & July.	80,000	2 50	125	....	
1849	Lowell	Mass.	200,000	25	5	Do.	50,000	3 25	....	....	
1852	Lynchburg	Va.	70,000	25	5	Do.	6,000	3 80	....	....	
1852	Lynn	Mass.	55,000	50	4	Do.	20,000	4 00	....	....	
1859	Lyons	N. Y.	30,000	100	—	Do.	4,000	4 00	....	....	
1852	Macon	Ga.	75,160	25	6	Do.	5,000	5 00	....	....	
1851	Madison	Ind.	160,000	25	3	Do.	10,100	3 50	....	....	
1855	Madison	Wis.	100,000	25	—	Do.	5,000	5 00	....	....	
1854	Malden & Melrose	Mass.	50,000	25	3	February & August.	5,000	4 00	....	....	
1852	Manayunk	Pa.	40,000	100	—	Do.	7,000	4 00	....	....	
1852	Manchester	N. H.	100,000	100	5	January & July.	25,500	3 00	....	....	
1830	Manhattan (N. Y. City)	N. Y.	4,000,000	50	5	Do.	600,000	2 50	....	....	
	Mansfield	O.	25,000	—	—	Do.	10,000	4 00	....	....	
1854	Marblehead	Mass.	40,000	100	3	Do.	1,000	4 00	....	....	
	Marlboro'	Mass.	20,000	—	—	Do.	8,000	4 00	....	....	
	Mauch Chunk	Pa.	50,000	50	—	Do.	7,000	4 00	....	....	
1857	Marietta	O.	50,000	50	—	Do.	7,000	4 00	....	....	Stock firm.
1860	Marion	O.	12,000	25	5	April & October.	1,500	13 55	....	....	
1858	Marysville	Cal.	50,000	100	—	January & July.	4,000	2 50	....	....	
1857	Massilon	O.	20,000	25	—	Do.	5,000	3 00	....	....	
1855	Meadville	Pa.	39,000	25	3	Do.	4,000	3 50	....	....	
	Medina	N. Y.	2,000	100	—	Do.	2,000	7 00	....	....	
1852	Memphis	Tenn.	300,000	100	5	June & December.	12,000	5 00	....	....	
	Meriden	Ct.	20,000			Do.			....	....	
1859	Metropolitan (N. Y. City)	N. Y.	1,000,000	100	—	January & July.	200,000	2 50	....	....	
1859	Middleboro'	Mass.	15,000	—	—	Private Works.		6 00	....	....	
1853	Middletown	Ct.	50,000	25	3	March & September.	5,000	3 80	....	....	Owned by G. T. Sutton
	Middletown	N. Y.		25	—	Private Works.	3,000	3 00	....	....	
	Milford	Mass.	20,000	—	—	Do.		4 00	....	....	
	Milledgeville	Ga.	100,000	50	—	Do.		5 00	....	....	
	Milton	Pa.	10,000			Do.			....	....	
1847	Milwaukee	Wis.	400,000	50	5	January & July.	24,000	3 50	150	....	
1852	Mobile	Ala.	200,000	—	—	Do.	20,000	4 50	....	....	
1836	Monroe	Mich.	40,000	50	—	Do.	5,000	3 50	50	....	
1852	Montgomery	Ala.	100,000	25	4	February & August.	7,000	6 00	....	....	
1856	Montpelier	Vt.	30,000	25	3	January & July.	5,000	4 50	....	....	
1859	Morrisania	N. Y.	30,000	50	—	Do.		4 00	....	....	
1859	Morristown	N. J.	18,000	50	—	Do.	3,500	4 00	....	....	
1854	Mount Holly	N. J.	16,650	25	3	April & October.	2,000	7 00	....	....	
	Mount Vernon	O.	50,000	100	—	Do.		4 00	....	....	
1857	Muscatine	Iowa.	50,000	100	—	January & July.	3,000	4 50	....	....	
1854	Nantucket	Mass.	50,000	100	3	February & August.	6,000	4 00	....	....	

GAS-LIGHT COMPANIES IN THE UNITED STATES.—Continued.

Compiled from official sources expressly for the AMERICAN GAS-LIGHT JOURNAL.

CORRECTED BY JOHN B. MURRAY & CO., No. 11 BROAD STREET, NEW YORK, SHARE BROKERS.

When Chartered.	Town.	State.	Chartered Capital.	Par Val. per Sh. $	Semi-Ann'l Div.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1852	Nashua	N. H.	45,000	50	3½	January & July.	10,000	3 50	....	....	
1850	Nashville	Tenn.	200,000	50	5	Do.	25,000	3 50	....	....	
1858	Natchez	Miss.	46,000	50	—	Do.	20,000	5 00	....	....	
	Nevada City	Cal.							....	....	
1852	New Albany	Ind.	200,000	50	3½	Do.	16,000	3 50	....	....	
1846	Newark	N. J.	362,000	50	5	Do.	45,000	3 62	130	....	Always a favorite stock.
1856	Newark	O.	30,000	100	—	Do.	7,000	5 40	....	....	
1852	New Bedford	Mass.	130 000	100	5	Do.	15,000	2 90	102	....	
1859	Newbern	N. C.	22,000	100	6	Do.	6,000	3 50	....	....	Well managed and kept quiet.
	New Britain	Ct.	30,000	20	5	Do.	3,000	4 00	....	....	
1851	New Brunswick	N. J.	100,000	20	4	Do.	8,000	3 00	115	....	
1852	Newburg	N. Y.	67,000	20	4	Do.	10,000	4 00	105	....	
1852	Newburyport	Mass.	150,000	10	4	Do.	9,000	4 00	92½	....	
1857	Newcastle	Del.	32,300	10	3	Do.	4,000	4 00	90	....	
1847	New Haven	Ct.	250,000	25	4	Do.	30,000	3 00	155	....	
1853	New London	Ct.	70,000	50	3	Do.	12,000	4 00	105	....	None in market.
1835	New Orleans	La.	1,500,000	100	6	Do.	120,000	4 00	180	....	
1858	Newport	R. I.	130,200	100	4	Do.	10 000	3 50	112	....	
1854	Newton & Watertown	Mass.	92,000	100	2	Do.	10,000	4 00	....	....	
	Newton	N. J.	30,000	—	—	Do.	3,000	4 00	....	....	
	Newton	Pa.	20,000	50	—	Do.	2,500	4 00	....	....	
	Newtown	N. Y.									
1823	New York	N. Y.	1,000,000	50	5	May & November.	100,000	2 50	300	....	
1859	Niagara Falls	N. Y.	15,000	25	—	Do.	3,000	4 00	90	....	
	Norfolk	Va.	60,000	25	—	Do.	40,000	4 00	....	....	
1853	Norristown	Pa.	41 700	25	4	June & December.	8,000	3 50	....	....	
1855	North Attleboro'	Mass.	50,000	100	3½	Do.	6,000	4 00	....	....	
	Northern Liberties	Pa.	400,000	25	7	City Works.	40,000	2 50	....	....	
	North Adams	Mass.	25,000	—	—	March & September.	30,000	4 00	....	....	
1856	Northampton	Mass.	35,000	25	3	January & July.	4 500	4 00	....	....	
1859	North Bridgewater	Mass.	16,000	100	4	June & December.	1,000	7 00	....	....	
1856	Norwalk	Ct.	30,000	150	4	February & August.	6,000	4 00	....	....	
1859	Norwalk	O.	30,000	25	—	January & July.	4,000	4 00	....	....	
1854	Norwich	Ct.	75,000	25	3½	Do.	12,000	3 50	....	....	
1861	Norwich	N. Y.	12,000	50	—	Do.	2,500	4 00	....	....	
1859	Nyack	N Y.	20,000	100	—	Do.	2,500	4 00	....	....	
1860	Oberlin	O.	10,000	—	—	Do.	1,200	4 00	....	....	
1855	Ogdensburg	N. Y.	75,000	50	5	Do.	9,000	4 00	....	....	
1859	Orange	N. J.	65,000	25	—	Do.	6,000	3 50	....	....	
1852	Oswego	N. Y.	81,250	100	3½	Do.	15,000	4 00	105	....	
1855	Ottawa	Ill.	45,000	100	6½	Do.	6,000	4 00	....	....	Good works, built by Hoy, Jr., & Kennedy.
1856	Owego	N. Y.	40,000	50	3½	Do.	5,000	4 00	....	....	
1860	Owensboro'	Ky.	25,000	25	—	Do.	4,000	3 50	....	....	
1856	Paducah	Ky.	75,000	100	—	May & November.	4,000	5 00	....	....	
1861	Painsville	O.	40,000	25	5	Do.	2,500	5 00	....	....	
1856	Palmyra	N. Y.	12,000	25	—	January & July.	3,000	7 00	....	....	
1847	Paterson	N. J.	125,000	25	3	Do.	20,000	3 50	95	....	
1850	Pawtucket	R I.	75,000	50	4	Do.	12,000	3 00	....	....	
1855	Peekskill	N. Y.	31,000	50	3	June & December.	4,000	4 00	....	....	Surplus $10,000, May 15, 1863.
1860	Penn Yan	N. Y.	12,000	50	5	Do.	3,000	4 00	....	....	Works leased to Gilbert T. Sutton.
1859	Peoples', Chicago	Ill.	500,000	50	New	Do.	100,000	2 50	....	....	
1855	Peoria	Ill.	100,000	50	4	Do.	8,000	3 50	....	....	What is this Company doing?
1852	Petersburg	Va.	120,000	—	5	January & July.	20,000	3 80	....	....	
1841	Philadelphia	Pa.	3,000,000	50	—	City Works.	650 000	2 50	....	....	
1855	Piqua	O.	50,000	50	—	January & July.	6,500	4 00	....	....	
1835	Pittsburg	Pa.	300,000	100	5	Do.	60,000	1 50	115	....	
1854	Pittsfield	Mass.	50,000	100	5	Do.	4,500	4 00	....	....	
1858	Placerville	Cal	30,000	50	—	Do.	4,500	10 00	....	....	
1860	Plainfield	N. J.	25,000	50	—	Do.	2,500	4 00	....	....	
1859	Plattsburg	N. Y.	16,000	50	—	January & July.	5,000	7 00	....	....	
1853	Plymouth	Mass.	40,000	100	—	April & October.	8,000	4 00	....	....	
1860	Port Chester	N. Y.	50,000	50	—	Do.	4,000	4 00	....		
1860	Port Jervis	N. Y.	20,000	100	—	Do.	3,000	4 10	....	....	
1849	Portland	Me.	300,000	50	4	January & July.	30,000	3 00	....	....	
1859	Portland	Oreg.	50,000	50	—	Do.	3,500	8 00	....	....	
1859	Port Lavacca	Texas.	50,000	100	—	Do.	2,500	7 00	....	....	
1851	Portsmouth	N. H.	70,000	100	8	April & October.	6,500	3 70	....	....	
1855	Portsmouth	O.	50,000	50	4	January & July.	10,000	3 50	....	....	
1855	Portsmouth	Va.	100,000	50	4	Do.	4,000	4 00	....	....	
1856	Pottstown	Pa.	20,000	50	3	Do.	3,500	4 00	....	....	
1850	Pottsville	Pa.	110,000	50	2	Do.	10,000	3 50	....	....	
1850	Poughkeepsie	N. Y.	84,000	25	4	March & September.	15,000	3 50	120	110	
1848	Providence	R. I.	1,000,000	50	4	January & July.	60,000	3 00	122	....	
1853	Quincy	Ill.	300,000	50	4	June & December.	12 000	3 50	....	....	
	Quincy	Mass.	00,000	00	—	Do.	00,0 0	0 00	....	....	
1855	Racine	Wis.	43,500	26	—	Do.	7,000	3 50	....	....	
1857	Rahway	N. J.	50,000	20	—	January & July.	5,000	4 00	....	....	
1858	Raleigh	N. C.	25.000	100	6	May & November.	5,000	6 00	....	....	
1848	Reading	Pa.	100,000	25	4	January & July.	25,000	3 00	....	....	
1851	Richmond	Va.	341.975	—	—	City Works.	30,000	3 00	....	....	
1859	Richmond	Mass.	40,000	25	—	January & July.	3,000	4 00	....	....	Jeff. Davis has extinguished the gas-lights of Richmond, Va.
	Richmond County	N. Y.									
1859	Ripley	O.	25.000	50	—	April & October.	2,000	4 00	....	....	
1852	Rochester	N. Y.	200,000	50	5	January & July.	50,000	2 50	....	....	
1857	Rockford	Ill.	40,000	50	—	Do.	4,000	4 00	....	....	
1854	Rock Island	Ill.	100,000	50	—	Do.	6,000	4 50	....	....	
1854	Rockland	Me.	50,000	100	—	Do.	6,000	4 40	....	....	
1852	Rome	N. Y.	35,000	100	3½	Do.	10,000	3 60	....	....	
1854	Rondout and Kingston	N. Y.	65,150	20	3½	June & December.	10,000	3 80	....	....	
1854	Roxbury	Mass.	150,000	100	5	January & July.	20,000	3 00	....	....	
1859	Rutland	Vt.	20,000	25	—	Do.	4,000	3 50	....	....	
	Saco	Me.	71,600	100	3½	April & October.	8,000	4 00	....	....	
1857	Sacramento	Cal.	500,000	100	—	Do.	40,000	10 00	....	....	
1859	Sag Harbor	N. Y.	20,000	—	—	Do.	4,000	4 00	....	....	
1858	Saint Albans	Vt.	15,000	20	—	Do.	3,000	7 00	....	....	
	Saint Johnsbury	Vt.	30,000	25	—	Do.	4,000	4 00	....	....	
1857	Saint Joseph	Mo.	50,000	100	5	January & July.	6,000	5 00	....	....	
1839	Saint Louis	Mo.	600 000	50	—	June & December.	180 000	3 50	....	....	
1857	Saint Paul	Min.	200,000	50	3	January & July.	10,000	6 00	....	....	Surplus $10,000, May 15, 1863.
1856	Salem	N. J.	30,000	25	3	Do.	5,000	3 86	....	....	
1850	Salem	Mass.	200,000	100	4	February & August.	30,000	3 24	....	....	
1859	Salem	O.	25,000	20	—	Do.	3,000	3 00	....	....	
1859	Salisbury	N. C.	14,600	50	6	May & November.	3,500	6 00	....	....	
	Salisbury Mills	Mass.	1,250	25	—	Do.	3,000	4 00	....	....	
	Salmon Falls	Me.	25,000	100	—	Do.	3,000	4 00	....	....	
	San Antonio	Texas.	75,000	20	—	Do.	40,000	6 00	....	....	
1854	Sandusky	O.	75,000	50	—	April & October.	9,000	3 00	....	....	
1859	Sandwich	Mass.	10,000	—	—	Private Works.	2,000	3 50	....	....	
1852	San Francisco	Cal.	2,000,000	100	4½	Do.	100,000	6 50	100	....	
	San Jose	Cal.							....	....	
1853	Saratoga Springs	N. Y.	39,000	100	—	January & July.	6,000	3 60	70	....	
	Saugerties	N. Y.	30,000	20	—	Do.	4,000	3 00	....	....	
1849	Savannah	Ga.	200,000	25	5	Do.	10,000	3 75	....	....	
1851	Schenectady	N. Y.	50,000	—	—	Private Works.	11,000	4 00	....	....	
1858	Scranton, Gas and Water	Pa.	100,000	25	—	January & July.	6,000	3 80	....	....	About trying Water-Gas.
1857	Selma	Ala.	20,000	100	—	Do.	2,000	5 00	....	....	
1856	Seneca Falls and Waterloo	N. Y.	80,000	50	3	Do.	10,000	4 00	100	....	
	Shreveport	La.	40,000	25	—	Do.	3,000	6 50	....	....	
1856	Sing Sing	N. Y.	40,000	100	—	Do.	3,000	3 50	....	....	
	Smyrna	Del.						4 00	....	....	Petroleum Gas.
1860	South Adams	Mass.	10,000	25	—	Do.	3,000	4 00	....	....	
1859	South Bridge	Mass.	5,000	25	—	Do.	4,010	6 00	....	....	
	South Boston	Mass.	200 000	50	—	Do.	60,000	3 25	110	....	
	Springfield	O.	200,000	100	—	Do	20,000	3 50	....	....	
1854	Springfield	Ill.	75,000	50	—	January & July.	10,000	3 50	....	....	
1848	Springfield	Mass.	100,000	500	5	February & August.	10,000	3 60	140	....	
1855	Stamford	Ct.	6,250	25	5	April & October.	3,000	3 50	....	....	
1857	Staten Islan	N. Y.	150,000	50	5	January & July.	26,000	4 00	95	....	

GAS-LIGHT COMPANIES IN THE UNITED STATES.—Continued.

Compiled from official sources expressly for the AMERICAN GAS-LIGHT JOURNAL.

CORRECTED BY JOHN B. MURRAY & CO., No. 11 BROAD STREET, NEW YORK, SHARE BROKERS.

When Chartered.	Town.	State.	Chartered Capital.	Par Val. per Sh. $	Semi-Ann'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1853	Staunton	Va.	18,000	50	6	January & July.	4,000	7 00	....	....	
	Steubenville	O.	150,000	100	—	Do.	15,000	4 00	....	....	
	Stockton	Cal.	50,000	—	—	Do.	8,000	10 00	....	....	
1848	Syracuse	N. Y.	125,000	25	5	March & September.	25,000	3 00	112	....	
	Tamaqua	Pa.	40,000	25	—	Do.	3,000	4 00	....	....	
1859	Tarrytown and Irvington	N. Y.	70,000	50	—	January & July.	3,000	4 00	....	....	
1853	Taunton	Mass.	100,000	50	4	Do.	10,000	4 00	....	....	
	Terre Haute	Ind.	100,000	100	—	Do.	3,000	4 00	....	....	
	Thompsonville	Ct.	25,000	50	—	Do.	4,000	4 50	....	....	
	Tiffin	O.	25,000	20	—	Do.	4,000	4 00	....	....	
1853	Toledo	O.	100,000	50	3	Do.	8,000	3 50	....	....	
1847	Trenton	N. J.	100,000	20	4	Do.	15,000	3 42	....	110	
1848	Troy	N. Y.	200,000	100	4	June & December.	35,000	3 00	102	....	
1856	Urbana	O.	30,000	25	—	April & October.	3,500	4 00	....	....	
1849	Utica	N. Y.	80,000	100	4	Do.	22,000	3 60	....	....	
1858	Vicksburg	Miss.	66,000	50	—	March & September.	4,000	4 50	....	....	
1859	Vincennes	Ind.	25,000	100	—	January & July.	2,000	4 00	....	....	
1863	Virginia City	N. T.					20,000				
1858	Walden	N. Y.	2,500	—	—	Private Works.	1,000	6 00	....	....	
1853	Waltham	Mass.	100,000	100	4	January & July.	3,000	4 00	....	...	
1857	Ware	Mass.	30,000	20	—	Do.	3,500	4 00	....	....	
1861	Warren	O.	30,000	50	—	Do.	4,000	3 00	....	....	
1854	Warren	R. I.	20,000	25	—	Do.	3,000	4 00	....	....	
1855	Washington	D. C.	500,000	20	5	Do.	50,000	2 61	....	100	
1859	Washington	N. C.	15,000	100	—	April & October.	1,500	6 00	....	...	
1848	Washington	Pa.	20,000	25	4	January & July.	4,000	3 00	....	....	
1854	Waterbury	Ct.	100,000	25	—	Do.	4,000	4 00	....	....	
1852	Waterford	N. Y.	12,000	25	—	Do.	4,000	4 00	....	....	
1852	Watertown	N. Y.	20,000	100	—	Do.	10,000	7 00	....	....	
1856	Watertown	Wis.	25,000	100	—	Do.	5,000	5 00	....	....	
1858	Wautoma	Wis.	30,000	50	—	Do.	3,000	4 50	....	....	
1857	Waverly	Miss.	20,000	100	—	April & October.	4,000	5 00	....	....	
1854	West Cambridge	Mass.	60,000	100	—	February & August.	10,000	4 00	....	....	
1852	Westchester	Pa.	100,000	25	2½	Do.	3,500	3 50	....	....	
	Westfield	Mass.	25,000	100	6	Do.	4,000	4 00	....	....	
	Weston	O.	20,000	25	—	Do.		5 00	....	....	
1857	West Point	N. Y.	50,000	—	—	United States Military	Academy.	2 00	....	....	
1853	West Troy	N. Y.	100,000	50	3	January & July.	10,000	3 60	85	....	
1850	Wheeling	Va.	75,000	25	6	Do.	12,000	2 70	....	....	
	White Plains	N. Y.	20,000	20	—	Do.			....	....	
1856	Wilkesbarre	Pa.	50,000	50	—	May & November.	4,000	3 33	100	80	
1850	Williamsburg	N. Y.	1,000,000	50	5	January & July.	60,000	3 00	....	....	
1858	Williamsburg	Va.	30,000	25	—	Do.	3,000	4 00	....	....	Camp-fires of the Union Army light up this place at present.
1857	Williamsport	Pa.	70,000	25	4	Do.	3,500	3 80	....	....	
1859	Willimantic	Ct.	12,000	—	—	Do.	2,500	3 50	....	....	
1853	Wilmington	N. C.	60,000	50	5	Do.	8,000	5 00	....	....	
1852	Wilmington	Del.	200,000	50	5	February & August.	20,000	3 00	....	....	
1854	Winchester	Va.	36,000	50	6	January & July.	5,000	4 00	....	....	
1861	Windsor	Vt.	20,000	25		Do.	2,000	6 00			Make Petroleum Gas.
	Woburn	Mass.	20,000	—	—	Do.	3,000	4 00	....	....	
1856	Woodstock	Vt.	10,000	50	4	Do.	4,000	6 00	....	....	
1853	Woonsocket	R. I.	82,600	100	4	April & October.	4,000	3 50	....	....	
1856	Wooster	O.	25,000	50	—	January & July.	6 000	3 00	....	....	
1849	Worcester	Mass.	160,000	100	5	Do.	15,000	3 50	....	....	
1855	Xenia	O.	40,000	50	—	Do.	3,000	4 00	....	....	
1854	Yonkers	N. Y.	100,000	50	3½	Do.	10,000	3 50	110	16½	
1849	York	Pa.	40,000	57	3	June & December.	10,000	3 50	....	....	
	Yorkville	S. C.	20,000	25	—	Do.	4,000	4 00	....	....	
1858	Ypsilanti	Mich.	20,000	50	5	February & August	6,000	14 00	....	....	
1850	Yreka	Cal.	30,000	100	—	Do.	2,000	0 00	....	....	
1848	Zanesville	O.	44,600	25	4	Do.	10,000	3 00	....	..	

GAS-LIGHT COMPANIES IN THE BRITISH PROVINCES OF NORTH AMERICA.

When Chartered.	Town.	Province	Chartered Capital.	Par Val. per Sh. $	Semi-An'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1854	Belleville	C. W.	33,040	100	4	January & July.	1,200	5 00	....	....	
1854	Brantford	C. W.	32,000	100	2½	Do.			....	....	
	Brockville	C. W.	50,000	—	—	Do.	5,000	4 00	....	....	
	Chatham	N. B.	50,000	—	—				....	....	
1854	Charlotte Town	P. E. I.	50,000	100	5	Do.	3,000	3 50	....	....	
1857	Cobourg	C. W.	30,000	—	-	February & August.	4,000		....	....	
	Dundas	C. W.	30,000	—	—	Do.	6,000	4 00	....	....	
	Frederick	N. B.	50,000	—	—	Do.			....	....	
1843	Halifax	N. S.	160,000	20	7	May.	30,000	3 03	....	....	
1850	Hamilton	C. W.	125,000	40	5	March & September.	20,000	3 50	....	....	
1848	Kingston	C. W.	80,000	100	—	Do.	6,000	3 50	....	....	
1853	London	C. W.	100,000	20	5	May & November.	5,000	5 00	....	....	
1847	Montreal	C. E.	400,000	40	—	March & September.	110,000	2 80	....	113	Last sale at this figure.
1854	Ottawa	C. W.	40,000	40	5	Do.	5,000	4 50	...	....	
1859	Point Levi	C. E.	25,000	25	—	January & July.	4,000	3 50	....	....	
1859	Port Hope	C. W.	28,000	20	4	May & November.	4,500	3 50	....	....	
1847	Quebec	C. E.	200,000	200	4	January & July.	60,000	3 00	....	....	
1848	Saint Catherine's	C. W.	80,000	20	—	May & November.	7,000	4 50	....	....	
1859	Saint Hyacinthe	C. E.	15,000	20	—	Do.	4,000	4 00	....	....	
	Saint John	N. B.	170,000	85	4	June & December.	25,000	3 00	110	110	Sales at this figure.
	Saint John	N. F.	50,000	—	4	Do.	30,000		....	....	
1858	Sorel	C. E.	14,000	20	4	Do.	4,000	3 00	...	....	
1848	Toronto	C. W.	400,000	50	—		50,000	3 00	....	....	This Co. pay a quarterly div. of 2 per ct.

GAS-LIGHT COMPANIES IN CUBA, MEXICO, SOUTH AMERICA AND NEW ZEALAND.

When Chartered.	Town.	State.	Chartered Capital.	Par Val. per Sh. $	Semi-An'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
	Callao	Chile.		—	—	January & July.	20,000	7 00	....	....	
	Cardenas	Cuba.	50,000	—	—	Do.	180,000	5 00	....	....	
1857	Compania Cubana	Hav'a.	500,000	500	10	Do.			....	....	
	Cienfugos	Cuba.		—	—	Do.	12,000	5 00	....	....	These four towns are lighted by the Compania Cubana of Havana.
	Guanabacoa	Cuba.		—	—	Do.	14,000	5 50	....	....	
	Regla	Cuba.		—	—	Do.	10,000	5 00	....	....	
	Trinidad	Cuba.		—	—	Do.	16,000	5 00	....	....	
	Guiness	Cuba.		—	—	Do.			....	....	
	Guyaquil	S. A.	150,000	—	—	Do.	35,000		....	....	
	Havana	Cuba.	2,000,000	500	—	Quarterly.	200,000	5 00	....	175	
	Lima	Peru.	100,000	—	—	January & July.	150,000		...	...	
	Maranham (Chartered)			—	—	Do.			....	....	
	Matanzas	Cuba.	53,000	—	—	Do.	180,000	8 50	....	....	
	Mexico City	Mex.	550,000	—	—	Do.			....	....	
	Montevideo	S. A.	500,000	—	—	Do.			....	....	
	Para (Chartered)			—	—	Do.			....	....	
1854	Rio de Janeiro	S. A.	1,000,000	500	7½	Do.	300,000	4 00	...	....	
	San Iago	Chile.	500,000	—	—	Do.	180,000	7 00	....	...	
1857	Saint Jago de Cuba	Cuba.	450,000	500	—	Do.	25,000	5 00	....	....	
	Valparaiso	Chile.	500,000	—	—	Do.	85,000	6 00	....	....	
	Vera Cruz	Mex	500,000	—	—	Do.			....	....	
	Vi le Clara	Cuba.	50,000	—	—	Do			....	....	
	Auckland	N. Z.		—	—	Do			....	...	

PETROLEUM AS FUEL.

As our readers have been made aware, by the publication of previous articles in our numbers for April 16, and May 7, the introduction of crude petroleum as fuel is a subject that is now attracting considerable notice. The Commissioners appointed by the Federal Government have issued a favorable report on this employment of petroleum; and this report having been noticed in the money article of the *Times* of March 24, has received a great amount of attention both in this country and on the Continent.

The ready inflammability of petroleum, and the abundance and supposed inexhaustible character of the supply, have led many persons to think favorably of the proposal; and have even caused some practical men, who might be supposed to know better, to advocate the introduction of petroleum as fuel.

A very slight knowledge, however, of the chemical facts connected with combustion, is required to prove, that at even the lowest price of crude petroleum, its introduction as a fuel capable of competing with coal, is one of the wildest dreams that ever was conceived by an enthusiastic projector. It is these facts that we wish to lay before our readers in the present article.

The practically useful constituents of all varieties of ordinary fuel are two—namely, carbon and hydrogen. In some instances, as in coal and wood, oxygen is also present; but this is absent in petroleum. The products of the combustion of these two elements—carbon and hydrogen—are carbonic acid and water; and, provided the substance is perfectly burnt, the amount of heat given out by the same material is perfectly fixed and invariable, whatever may be the circumstances under which it is burnt, and whether the combustion be effected quickly or slowly.

The most important consideration connected with any fuel is the amount of heat it gives out during combustion. Fortunately, the relative amount of heat given out by equal weights of different fuels can be ascertained with a great degree of exactness. It has been found by direct experiment that one part of carbon in burning unites with two and two-thirds of oxygen; and that, during its combustion, sufficient heat is produced to raise the temperature of 8,000 parts of water one degree of the centigrade thermometer. It has also been found that one part by weight of hydrogen unites, when burning, with eight parts of oxygen, and produces sufficient heat to raise the temperature of 34,000 parts of water one degree centrigrade. Hence, the heat-giving powers of carbon and hydrogen are in the proportion of 8,000 to 34,000; or, in other words, hydrogen, in burning, gives out rather more than four times as much heat as carbon.

Now, it makes no difference whatever to the heat-producing power of these two substances whether they are burned separately or in combination; and, if the amount of carbon and hydrogen in any compound, such as coal or petroleum, be known, the amount of heat given out by its burning can be at once determined by a simple calculation.

The relative amount of carbon and hydrogen in petroleum is, in round numbers, six parts of carbon to one of hydrogen; whereas in coal the amount of hydrogen is less in proportion, and there is also a small amount of oxygen present, which diminishes the heat-producing power. The result is that the heat-producing power of petroleum is greater than that of an equal weight of coal; it is, in fact, about half as much again. The Federal Commissioners quoted in the *Times* state that the petroleum has double the heat-giving power of anthracite. There is no doubt that this statement is much too high an estimate, but as we have a wide margin, we will grant the assumption, although it is unfavorable to our argument. We assume, then, that one ton of petroleum has twice the heating power of one ton of coal. Now for the relative cost of petroleum and coal. The price of crude petroleum at New York, or anywhere on the American seaboard, was, on April 9, 34 to 35 cents per gallon, and it was rising steadily. The American gallon, it should be remembered, is one-fifth less than the English imperial gallon, being the same as our old Winchester ale gallon. The weight of an imperial gallon of petroleum is about 8 lbs.; consequently the weight of an American gallon would be, in round numbers, 6¼ lbs. This would make the cost price of crude petroleum somewhat about 3d. per lb. in America.

Let us compare this with the relative cost of petroleum and coal in England. The price of crude petroleum is 19*l.* to 19*l.* 10*s.* per ton. The price of steam coal may be roundly estimated at 15*s.*; or, in other words, at the lowest estimate, petroleum is twenty-five times the price of coal. Now, as even the advocates of the introduction of petroleum as fuel only claim for it a heating power of twice that of coal, it is obvious, according to their own showing, that petroleum is twelve and a-half times as dear a fuel as coal. Where, then, is the saving of 2,400*l.* per trip that was promised to the Cunard line of steamers?

A great stress is laid on the relatively greater economy of stowage; but as coal is half as heavy again as petroleum, it follows that, making every allowance for the loss of space caused by the interstices of the broken coal, that there would be little advantage gained in this respect by the use of petroleum.

It is said that there is a great advantage gained by the rapidity with which the steam can be got up with petroleum as compared with coal—namely, in the American experiments a pressure of 20 lbs. was obtained in twenty-eight minutes as against sixty minutes by coal. This, however, is a matter of small amount in an ocean-going steamer; and if requisite, furnaces can be so constructed as to get up steam very quickly with coal; our steam fire-engines, for example, get up steam to a working pressure as they are running to a fire.

Our readers need not be told that we are not actuated by any interest against the profitable employment of petroleum in any mode in which it can be applied. But, when a journal like the *Times*, in its ignorance of the most elementary scientific facts, tends to mislead its readers, we conceive that we are doing good service to those concerned in the oil trade by bringing the truth of the matter before the public.

WATER-WORKS OF AMERICA.

HARTFORD, CONN.

WATER COMMISSIONER'S OFFICE,
City of Hartford, March 28th, 1864.

To the Honorable Court of Common Council of the City of Hartford:

The Board of Water Commissioners respectfully submit their Annual Report for the current year ending February 29th, 1864.

RECEIPTS.

The total receipts for water-rents for the year have been as follows:

Amount received on regular rates.....		$40,164 60
" " extra per cent. from delinquents		179 39
Amount received on old bills of 1861.....		3 50
Total receipts.....		$40,347 49

DISBURSEMENTS.

The disbursements on account of the water-works have been as follows:

For pumping, including alterations and repairs of machinery.....	$10,228 85	
For general repairs, salaries, &c.	5,901 02	
For interest on water-fund....	22,500 00	
For int'rest on temporary loans	279 17	
		$38,909 04
Excess of receipts over expenses,....		1,438 45
		$40,347 49

The favorable effect of the rule requiring an extra percentage to be paid on all water-bills remaining over due, is seen in the fact that this percentage for the present year is but $179 39, against $314 90 for the year previous; and it is also worthy of notice that for the past year the entire amount of water-rents has been collected; not a single dollar remaining outstanding for the year. Indeed, it is perhaps worthy of further remark, that for the past six years (during which the collections for water-bills have amounted, in the aggregate, to the sum of $189,603 23) the entire amount of unpaid bills is only $95 62.

PIPE EXTENSIONS.

There has been laid, during the year, 8,087 feet of new extension main pipe, of which 4,007 feet was the "wrought iron and cement pipe;" making a total length of street mains now in use, of thirty-two miles and 1,306 feet.

SERVICE PIPE.

One hundred and fifty-one new service-pipes have been added the past year, making an aggregate number of service-pipes now in use of two thousand four hundred and thirty-four.

HYDRANTS.

Seven hydrants have been added the past year, making the whole number now in use one hundred and sixty-six.

STOP-COCKS.

Eleven additional stop-cocks have been connected with the street-mains the past year, making the total number two hundred and eight now in use.

COST OF NEW EXTENSIONS.

The expenditures on new construction account have been as follows:

For street-mains, hydrants, and stop-cocks,	$12,347 05
For service-pipe.....	2,129 63
Total for new construction.....	$14,476 68

WORKING TIME OF PUMPING ENGINE.

The entire working time of the pumping engine has been in hours	6,286 5-6
Average daily working time, allowing six days to a week, hours.....	20 1-10
Average daily increase over last year, hours,	3 3-100

QUANTITY OF WATER SUPPLIED.

The quantity of water supplied during the year, as registered at the Engine House, amounts in the aggregate, in United States gallons, to.....	565,002,949
Increase over last year.....	73,358 202
Average daily supply.....	1,543,723
Average daily increase over last year...	196,752

The quantity of water pumped, as registered as above, is undoubtedly greater than the true quantity actually delivered by the pumps, in the present state of the machinery.

The register indicates the number of pump strokes, and the quantity is deduced from this number as a basis, which, when the pumps were new and in perfect condition, gave probably very accurate results; but from admeasurements of the quantity of water drawn from the reservoir, on several different occasions, when the engine was not in motion, we are of opinion that about 15 per cent. should be deducted from the present registered amount.

On several occasions during the past year, the quantity of water drawn from the reservoir was such as to cause for several days in succession, a daily diminution of the head, while the engine was running up to its highest capacity, by night and by day, without any cessation.

IMPROVEMENT IN DISTRIBUTION.

From the commencement of the water supply, there has always been a difficulty in maintaining a sufficient head on the higher portions of the distribution, and this uncertainty of supply, has ever been a prolific source of individual complaints. From the low elevation of the reservoir; the constantly increasing draught by the lower sections of the city, and the small calibre of the feeding pipes, continually diminishing by the acretion of the interior tubercles, this difficulty has been steadily increasing to such an extent as to demand some remedy. And in order to give some temporary relief, the commissioners have made a connection of the distributing pipes, directly with the rising main, by extending a 16-inch branch pipe from the rising main on Spring street to the distributing main on Asylum street. They have also laid an eight inch pipe on Edwards street, connecting the Spring street with the Walnut street main, thus giving an additional and more direct feeder to the northwest portion of the city.

And since the large air chamber has been applied to the rising main at the engine house, in accordance with the order of the Council, upon the recommendation of Mr. Worthen, civil engineer, the connections between the rising main and the distributing mains have been left open, so that the city is now supplied directly from the river at all times when the engine is in motion—the surplus only passing into the reservoir—except a portion of Asylum Hill, west from Garden street, and along Rifle avenue, which still take their supply from the reservoir.

This arrangement has had the desired effect of giving an increased head to the higher elevations, where complaints were made, and has also to some extent relieved the overburdened pumping force, but at the same time fails to supply the water in its former state of purity in the general distribution, and this deterioration of quality is more visible on every occasion of a sudden rise in the river.

INCREASE OF PUMPING CAPACITY.

In accordance with the recommendations of engineer Worthen, approved by the Honorable Court of Common Council, the former air chamber on the rising main at the engine house, has been removed, and a new one of greatly increased capacity substituted; the pumps have been thoroughly repaired—one set at a time, while the others were kept constantly running—and the engine so regulated that its speed may be increased 25 per cent. with comparatively little increase of danger from accidents—the effect of the whole being an increase of the pumping capacity of about 25 per cent. over its highest capacity when entirely new.

This result is fully equal to all that was expected or claimed from these improvements, and yet the increased consumption is about equal to all the advantages gained by this increase of capacity. Since the great fire at Colt's Armory, on the 5th of February last, which destroyed the pumping machinery which supplied the armory works and the meadow tenements, the remaining portion of the works, together with the Willow Works, and including 145 families, have been entirely supplied by the city works, and it appears now probable that this new demand will be permanent.

STREET GRADING.

Owing to the regrading of Edwards street, north of Walnut, it became necessary during the past year, to lower some five hundred feet of main pipe along that portion of the street, together with all the service pipes therewith connected—a kind of work exceedingly disagreeable as well as expensive, the necessity for which, the Commissioners beg leave to suggest, should be more carefully guarded against. Measures should be taken to determine upon, and establish, some final grade in every street, before the main pipes are laid, in order to obviate this too frequent necessity, of relaying, at lower grades whole lines of street mains with all their connections.

LEAKAGE.

The waste from leakage on the general distribution, has been perceptibly less during the past year than formerly, and the principal leaks which have occurred, have been occasioned by a disturbance of the street mains in laying sewers. Unless great caution is observed in trenching for sewers along the lines of street mains, and especially where the mains are undermined, and care taken in repacking the trenches, the pipes are left inevitably to settle, causing fractures in themselves and their connections, and thus producing leaks, not easily remedied.

In other cities, the subject of sewers and sewer construction, is placed under the immediate supervision of the water department, thereby securing a unity of action in both departments. In our city, where the water board has no control over the subject of sewers, such unity should be attained, as far as is possible, by mutual conference and care in the respective works.

The leakage along the rising main, especially on Village, Main, and Church streets, has ever been a constant source of annoyance and expense, and more than usually troublesome for the past year. This leakage has been undoubtedly caused by the vibrations of the pump strokes, and with the former diminutive and inefficient air chamber, could not be effectively prevented; but it is believed that the application of the new and enlarged air chamber, will afford nearly or quite a perfect remedy—and so far since its application has had a promising effect.

For the purpose of exhibiting in detail various matters connected with this department, sundry summaries and tables have been carefully prepared, and hereto appended; to which reference is made.

For quantity, size and locality of pipes, hydrants and stop-cocks, added the past year, see appendix A and B.

For statement of revenue for past year, and estimates of receipts and expenses for the current year, see appendix C and D.

For summary of receipts and expenditures from the commencement of the works up to March, 1864, see appendix E and F.

For exhibit of quantity and sizes of pipe, hydrants and stop-cocks now in use, see appendix G.

For costs of the various departments of the water works up to the present time, separately stated, see appendix H.

For tabular exhibit of engine duty for the past year, see Appendix I.

For tabular statement of annual increase of water consumption, engine duty, water receipts, and contingent expenses, for each year from the commencement, see Appendix J.

For present liabilities, see Appendix K.

In estimating the amount necessary to be raised by tax, to provide for extensions of main and service-pipe, the current year, it is proper to state, that the amount expended last year exceeded the estimated amount in the sum of $8,985 72. Of this amount, however, about $6,400 was for the improvements and repairs of the pump-works and distribution, hereinbefore alluded to, not estimated for, or then contemplated, but since ordered, and the balance only, is the excess over the estimate. There was also a deficiency of $1,060 35 in the tax income; the amount received being that amount less than the estimated amount.

This excess and extra outlays may be stated as follows:

For pumping expenses and extra outlays	$3,328 85	
For contingent expenses and extra outlays	1,180 19	
For new mains and service-pipe, and extra outlays	4,476 68	
		$8,985 72
Add deficiency in tax income		1,060 35
Total deficiency for the year		10,046 07
Deduct excess of receipts over estimate for water-rents		347 49
Balance of deficiency for the year		9,698 58
Estimate for main and service-pipes, current year		8,000 00
Amount to be provided for		17,698 58
Estimated surplus from water-rents	$4,000 00	
Amount still due for taxes	500 00	
Balance to be provided for by tax	13,198 58	
		$17,698 58

The amount which may be required the current year, for new extensions of main-pipes, cannot now be anticipated with any reliable degree of certainty. As the rule requires a guarantee from individuals of ten per cent. income, on the cost of such new extensions, it is apprehended that, at the present extra cost of materials and labor, but comparatively few will be willing to assume such guarantee; and the estimate is therefore reduced to $2,000 from the estimate of last year.

It has been a subject of congratulation that, for the past three years, this Board has been able to report the pleasant fact, that the Water Department of our city had become a self-sustaining one—the annual revenue from water-rents being more than sufficient to pay all the interest on the water-fund, and the entire current expenses of the department, other than those incurred on construction account for new extensions of the works.

It is now inevitable, that a new debt is to be created, to furnish, from some source, an additional supply of water. And if, to the interest of this new debt, there is also to be added a greatly increased annual expense for pumping, it is just as inevitable that the annual income from water-rents, at the present scale of rates, will be insufficient to pay the annual interest and expenses thereafter; and that this deficiency will have to be provided for, either by an increased scale of rates, or an increased burden upon the tax-list.

It is much to be regretted that, in so vitally important a matter as an additional supply of pure and wholesome water for the daily uses of our growing city, attempts should be made to bias the popular judgment, in favor of, or against, this or that project, by anonymous and irresponsible writers, who have neither investigated, nor have the means for investigating, a subject of this character; and unless the voting class will have the wisdom to discard, utterly, all representations made upon this subject, by anonymous and ignorant or interested parties, and base their action upon the authenticated results of careful investigations, made by experienced, skillful, and responsible engineers, of known integrity and ability, we shall be very liable to fall into very grave mistakes in this matter, and discover our error when it is too late to correct it.

We present herewith, in detail, the annual accounts of this department for the fiscal year, commencing with March 1st, 1863, and closing on the 29th day of February, 1864.

Respectfully submitted,

HIRAM BISSELL,
SETH. E. MARSH,
N. H. MORGAN,
ELISHA T. SMITH,
S. H. HAVENS,
} Water Commissioners.

[We have not space to publish the appendix to the report, but merely add the following tables, which may be of interest to hydraulic engineers.—ED.

EXHIBIT OF ENGINE DUTY DURING THE PAST YEAR.

MONTHS.	Running Time. Hours.	Running Time. Minutes.	Number of Revolutions of Cam Shaft.	Total Pounds of Coal Consumed.	Gallons of Water delivered into Reservoir.	Average No. of Gal. delivered into Res. for each lb. of Coal consumed.	Average number of Gallons consumed per day.	Average number of Gallons consumed every day in the year.
1863. March	432	45	957,072	81,700	89,208,480	478	1,964,628	1,543,725
April	407		940,340	76,300	86,651,850	480	1,921,728	
May	541		314,192	95,500	47,914,280	501	1,545,620	
June	554		315,992	103,200	48,184,296	466	1,606,140	
July	619	15	956,519	115,900	53,759,147	463	1,734,971	
August	649	40	876,620	121,600	57,434,550	472	1,852,727	
September	539	15	813,796	102,0 0	47,859,891	469	1,595,329	
October	525	55	803,199	97,200	46,237,847	475	1,491,543	
*November	521	25	831,869	92,300	43,296,317	470	1,444,010	
*December	444	55	809,920	96,980	44,565,640	464	1,437,575	
1864. *January	583	20	969,941	118,700	51,848,261	456	1,672,721	
*February	518	10	858,859	104,200	47,728,382	457	1,645,938	
	6,946	50	3,724,329	1,200,180	565,602,949	470		1,543,725

* Only three of the four pumps were in operation a portion of the time, viz., from the 17th of Nov. to the 2d of Dec.; in January, from the 7th to the 15th; in February, from the 4th to the 12th, and from the 17th to the 22d instant.

The tabular statement below shows the annual increase of the consumption of water, the corresponding engine duty, the total receipts for water, and the contingent expenses for each respective year, from the commencement:

	Running time of engine. Hours.	Running time of engine. Minutes.	Total pounds of coal consumed.	Gallons of water delivered into the reservoir.	Average number of gallons consumed per day.	Annual receipts for water rents.	Receipts for water rents in arrears.	Current expenses, including interest.
In 1856,	1291		282,944	104,914,656	345,114	$7,699 06		
In 1857,	2169		376,900	190,456,203	521,797	16,112 07	$49 12	$18,940 72
In 1858,	2718	50	459,024	242,354,674	661,245	21,891 75	1,105 41	25,570 35
In 1859,	3205	35	582,372	286,648,004	785,338	26,000 21	2 92	29,985 76
In 1860,	3577	11	683,200	327,417,801	897,035	30,098 44	9 25	30,271 99
In 1861,	4499	30	777,925	401,080,385	1,098,850	33,259 00	4 50	31,166 78
In 1862,	5542	10	993,400	491,644,747	1,346,971	36,899 92	110 95	32,227 41
In 1863,	6956	50	1,200,180	565,602,949	1,548,728	40,348 99	8 50	38,969 04

K.

PRESENT LIABILITIES

May be stated as follows:

375 Water Fund Bonds, $1,000 each	$375,000 00
Debt for extensions last year (see balance page 18)	9,698 58
Total	$384,698 58

THE AMERICAN GAS-LIGHT JOURNAL is published on the 1st and 15th of every month, and is the recognized official organ of

LIGHT, HEAT, WATER-SUPPLY AND SEWERAGE.

Its purpose is to ascertain and make known all new discoveries in the science and economical application of LIGHT, and promote thereby the interests of companies and consumers; to encourage and aid the introduction of PURE WATER from Lakes and Rivers into Towns and Cities, and to improve the system of SEWERAGE, VENTILATION, HEATING, and DRAINAGE everywhere.

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THE
AMERICAN GAS-LIGHT JOURNAL,

PUBLISHED ON 1ST AND 15TH OF EVERY MONTH.

C. ELTON BUCK, ... EDITOR.

WEDNESDAY, JUNE 15, 1864.

VALEDICTORY.

It is with much regret that the undersigned announces his retirement from the editorial chair of the AMERICAN GAS-LIGHT JOURNAL. It would have been grateful to his feelings could he still remain at his post, and continue in the pleasant relations existing between him and the readers of the paper. The increasing demands of his private professional engagements, and the necessity of frequent absences from home, necessitate a larger share of time and attention to be devoted to them, and hence he is reluctantly obliged to sever his connection with the JOURNAL, and to resign the editorial pen to other hands. In making this announcement, the writer experiences more than the ordinary emotions usually felt at parting with friends. During the three and a half years in which he has been engaged in bringing before his readers the various topics in which they have taken so deep an interest, he has had the pleasure of becoming personally acquainted with most of the leading gas engineers of the country, and in this connection it is but fitting to acknowledge the uniform courtesy and attention he has ever received at the hands of the profession. Without a single exception, his inquiries have been promptly and unreservedly answered; many valuable hints have been suggested, and much information as to the practical working of various processes, freely given.

In taking leave of the numerous readers of the JOURNAL, the writer would solicit their encouragement and bespeak their support for the gentleman who succeeds to the proprietorship of the paper. It is the determination of the new publisher to place it in the front rank of technical serials, and while it will be devoted, as heretofore, to the specialties of light, water supply, and sewerage, it is probable that other industrial subjects will furnish topics for discussion, which will enhance its interest to its patrons.

The writer will still look upon the JOURNAL with feelings of deep and abiding interest; and although his official connection ceases with this issue, he may incidentally find leisure to pen a few fragments for its pages, and to occasionally greet his former friends and patrons through its columns.

C. ELTON BUCK.

New York, June 14, 1864.

THE GREAT COAL-OIL CASE.

The very important suit of YOUNG *vs.* FERNIE, which has occupied the attention of the Vice-Chancellor of England for thirty-five days, has at length been decided in favor of the plaintiff, JAMES YOUNG, the well-known inventor and patentee of the process for distilling paraffine oils from Boghead and other coals. We hope that all parties who may be disposed to ignore Mr. YOUNG's indisputable claim to priority in the manufacture of coal-oil will profit by the example he has made of the defendant in the recent case, as well as of others who have attempted to infringe his process, and who have been summarily dealt with by the courts, wherever the question has been tried.

This case has excited great attention in the oil-trade of England, and for upwards of a month the technical journals of that country have been teeming with references to its progress. A great number of scientific witnesses were examined on both sides, some of whom, we are sorry to say, exhibited more of the spirit of advocates paid to talk up a poor case than the proper tone which should be shown where matters purely scientific in their nature are discussed. Others of these witnesses displayed a total ignorance of the principles involved in the manufacture, and one of them, Dr. ANDERSON, was severely snubbed by the Vice-Chancellor in his opinion in the case.

There is a wide diversity of opinion, both in this country and in England, as to the right of YOUNG's claim to a patent for making paraffin oil. It is true that, long before YOUNG took out his patent, paraffin was known to be a product of the destructive distillation of coal, but, notwithstanding this knowledge, this substance was not manufactured on any scale until Mr. YOUNG, after years of experiment and hard labor, established certain principles, by which alone the manufacture could be successfully carried on. As a matter of course, when his patent was granted, a great hue and cry was raised by numbers of jealous competitors, who claimed that what Mr. YOUNG had secured by letters patent was no new thing at all, and were we to believe the testimony of these gentlemen, it would appear that Mr. YOUNG had thrown no new light on the subject, and that he was merely sailing under false colors, and imposing a burden on the trade. The decisions which have been made in these cases have triumphantly sustained Mr. YOUNG, and have discomfited his opponents. It has been proved that he created the art of distilling coals for oils; for, before his invention, the clumsy attempts to do the same thing did not deserve the name of an art.

Below we append a portion of the opinion of the Chancellor, relating to the evidence of Dr. ANDERSON, and in another column we reprint the comments of the *London Grocer* on the subject. This article will repay a careful perusal:

"Dr. ANDERSON was remarkable for having changed his opinion upon the occasion of this trial: and it certainly did seem a most extraordinary change, under all the circumstances. When he was challenged with it, he admitted that his after-acquired knowledge had induced it. What was this after-acquired knowledge? He said it was through reading Selligue's specification, Happy and Black's 'Elements of Chemistry;' but when the Court came to look into the works quoted, it found the excuse a very lame one, and the value of the evidence had been reduced in consequence to a very low degree. This kind of evidence could not by any means help the Court to a conclusion, and most certainly it could prove to be no real assistance to the defendant's case. The Court felt bound to mark, by the expression of its opinion, that it looked upon evidence of this character with the greatest distrust. If the Court were to place any reliance upon such evidence, it would result in a most unsatisfactory state of things for patentees, and he found that in the whole of the scientific evidence there was a great deal that bore in the same direction. Experiments had been multiplied and multiplied for this case, and the Court could not shut its eyes to the fact that evidence had been manufactured for this case. It was not the wish of the Court to press hardly upon the defendant's evidence, but it did appear to be so."

After this sharp rebuff, we hope that Dr. ANDERSON, and all other witnesses in cases of this kind, will take a little care to understand the subjects they attempt to explain. Such exhibitions as the one in question smack strongly of quackery in its worst form, and they should be discouraged by all true lovers of science.

PHOTOMETRICAL OBSERVATIONS.

According to the evidence recently given in London, before the Committee of the English House of Lords on the Birmingham and District Gas Consumers Company, it appears that some discrepancy exists in the ordinary photometrical tests, where spermaceti candles are used as the standard. By experiments recently tried, it has been demonstrated, that sperm candles of large size give proportionally a much larger amount of light than those of smaller dimensions. This discovery may revolutionize the present system of photometrical testing, and may induce the substitution of a more reliable standard than the sperm candle now universally employed in this country and Great Britain. Although the standard candle consuming 120 grains of spermaceti an hour has been so long relied upon, we have heard many objections raised against it, and some well known experts in this country have endeavored to obtain a satisfactory substitute. This has not yet been done. Below we extract some remarks on this subject from the *Journal of Gas Lighting*. The gas test of ERDMANN referred to was fully described and illustrated on page 184 of Volume 2 of the AMERICAN GAS-LIGHT JOURNAL, but at the time it was published, several practical gas chemists dissented from the views laid down. Our opinion is that the hints thrown out by ERDMANN are well worth further investigation, and if they prove to be what their author claims for them, many of the tedious details of the present methods of photometrical observation will be obviated. As this subject has elicited some discussion among the English gas engineers, it is highly probable that it will be fully investigated, and some good may result from it. The English *Journal* thus refers to the question:

"These experiments demonstrate that the illuminating power of burning candles increases in a greater ratio than the direct proportion of the consumption of spermaceti. It has long been known that the illuminating power of gas increases in a greater proportion than the quantity consumed, but we believe it had not been previously known that the same law operates in the combustion of candles. It is evident, from the results of the photometrical experiments with the gas supplied by the Birmingham companies, that no correct conclusions can be drawn from proportionate quantities of either the gas or spermaceti consumed, inasmuch as the amount of light is influenced by the quantity of combustible matter burned within a given time. It has been suggested that some rule may be established by which the influence on the light of the flame, produced by the relative quantities of spermaceti undergoing combustion, may be determined and allowed for. Thus, it is probable that—after the proportions have been reduced to 120 grains consumed per hour—if 1 per cent., for each grain of spermaceti the candle may consume per hour less than 120 grains, be deducted from the indications of the photometer, and if 1 per cent. be added to similar indications of the photometer for each grain the candle may consume more than 120 grains, the results attained would not be far from the truth. But until the subject has been further investigated, it would not be safe to assume positively that such a scale of compensation would be correct. The new light which these experiments have thrown on photometry, shows the necessity for the adoption of some more certain standard of comparison than a spermaceti candle, the consumption of which it is impossible to regulate with accuracy. The Carcel lamp—which is similar to the 'moderator' lamp—is adopted generally on the Continent as the standard of comparison, and it possesses these advantages—the consumption of oil may be regulated with the greatest nicety, while its flame approaches in luminosity that of nine candles. At the same time, it must be observed that the lamp-wick requires great

attention, and the shape, and size, and position of the chimney have much more influence in effecting perfect combustion than the chimney of a gas-flame. The difficulty of attaining a correct indication of the illuminating power of gas by comparison with other flames points to the adoption of the atmospheric test, invented by Professor Erdmann, which was favorably noticed in our columns on the 9th of February last. By that instrument, as we there stated, neither photometers, nor candles, nor blackened chambers, are required, the illuminating power of the gas being determined by the quantity of atmospheric air mixed with a given quantity of gas before it ceases to give white light. Such a simple method of testing the illuminating power of gas has peculiar claims to favor at the present time, as the difficulty of attaining accurate results by photometrical observations has been shown by the Birmingham experiments to be even greater than before supposed."

TO OUR READERS.

The ownership of the AMERICAN GAS-LIGHT JOURNAL has passed into other hands. Commencing with the next number, it will be issued by its new proprietor, JAMES W. BRYANT, Esq, to whom it has been sold, and for whom the most favorable and generous welcome is bespoken from its readers. Mr. BRYANT is already known to the reading world, as proprietor and publisher of the *Cuban Messenger*, an enterprising paper published by him for some time in Havana, but which was suspended on account of the war in America.

The AMERICAN GAS-LIGHT JOURNAL sprang into existence on the first day of July, 1859, as an adjunct to my banking business. It was intended originally, to be a mere price current of gas-light shares, but so urgent was the need of a paper of its kind, that it soon grew into what it now is. It has gone steadily forward, in the face even of the disastrous war, of diminished subscriptions, limited advertisements, greatly increased price of paper, type, material, and labor, and yet it has not faltered in the size, frequency or extent of its issues. It was never more prosperous than at present, and in the hands of Mr. BRYANT, we believe, it can never be less so. He is, in my opinion, quite competent to conduct it as it should be conducted, and he should command the confidence and support of all who are interested in the specialties treated by the JOURNAL.

Mr. BRYANT asks no favors; he will be independent in his course, and just. He takes the JOURNAL with all its impetus upon it, and will certainly move on with it to triumphant success.

I part, regretfully, with my friend C. ELTON BUCK, Esq, its able and faithful editor, my association with whom is a privilege I have greatly valued. As a chemist he is destined to rank high, and yet the regrets at severing our connection are lessened by the reflection that his increasing professional engagements rendered it necessary to devote his whole time to them.

JOHN B. MURRAY.

LENOIR GAS ENGINE.—This engine is now in full operation, and can be seen at the Brass Cock Manufactory of Mr. A. CARR, No. 135 Mercer street, between Prince and Houston streets, in this city.

Its simplicity, economy, safety, and usefulness excite the admiration of all who see it.

For small industries, requiring not over five horse power, the Lenoir engine will be found superior to any other.

A company has been formed here under the title of "The Lenoir Gas Engine Company," with an ample capital, the larger part of which has already been subscribed, for the manufacture of these engines, and in the meantime the public are invited to call at Mr. CARR'S establishment and see the one in operation there.

PHILADELPHIA, PA.—In this city the trustees of the gas works are considering the propriety of advancing the price of gas to $3.00 per thousand cubic feet.

ANSWERS TO CORRESPONDENTS.

J. C. B., of Mass.—*The precise time has not been determined—The experiments were never brought to a successful issue.*

A. B, of Pa.—*The Company will give you all needed information.*

C. J. L., of N. Y.—*A new work on the subject is much needed. Hughes' is the best rudimentary book on gas making.*

L. R. F, of Md.—*If the coal is of the quality you assert it to be, it must be very valuable for gas making. It is important to ascertain the amount of sulphur it contains, as this may affect its value.*

S. R. S., of Ky.—*The process has not yet been tried on a sufficient scale to warrant any expressions in favor of its reliability. The second process you speak of can never become a success.*

PETROLEUM FOR SIGNAL AND OTHER LAMPS.

It is but a few years since the introduction into this country of the invaluable and practically inexhaustible stores of American Rock Oil, or Petroleum, and notwithstanding the prejudice which has been created and fostered against its use, the imports have, during the last three years, increased from 28,000 barrels in 1861, to 272,193 barrels in 1862, and to 700,000 barrels in 1863, or at the rate of 25 per cent., and are still largely increasing. Of these imports, there were consigned to Liverpool, in 1861, 6,000 barrels, in 1862 80,000 barrels, and in 1863, 160,000 barrels. It will be observed from the above that mineral oils are now entering into large consumption. The prejudice above alluded to, has arisen from a mistaken idea that the consumption of petroleum in lamps is unsafe, owing to its giving off inflammable vapor at temperatures to which it is liable to be exposed. This is not so in the properly prepared petroleum, and the accidents which have occurred, have originated from the use of the oil in its crude or partially and imperfectly prepared state, and from the lamps in which it was burnt not having been adopted to it. These accidents have been taken advantage of by persons interested in the manufacture and sale of other oils used for illuminating purposes; the consumption of which (as the superiority of the new oil in all respects, becomes more manifest) must necessarily diminish.

The minds of the public should be disabused of the above mistaken idea, the fact being, that the new oils, if properly refined, are not dangerous, but can be used in lamps constructed for the purpose, with perfect safety. It should be remembered that when coal-gas was first introduced, most serious objections to its use were entertained from its explosive nature, but this opposition has not prevented it from being used most extensively as an artificial light.

Captain Shaw, the superintendent of the London Fire Brigade, states, in his report for 1863, that no fires had been caused in that year in London by gas, and only one by petroleum, and that one by testing. The comparative advantages arising from the use of petroleum over that of other illuminating oils, should be pointed out. In the first place, with a flat wick six-eights of an inch broad, the illuminating power of petroleum is equal to 7.15 candles. Olive oil being only 2.20, the former being in excess of the latter about 150 per cent., while the cost of it, as ascertained from its use in railway signal lamps for one year, is more than 50 per cent. in its favor, against any other oil now used for that purpose. It will be observed from this, that the saving must be very great to railway companies and others from a pecuniary point of view (considering the large number of signal and other lamps now supplied with olive oil), in addition to the great increase in illuminating power. Again, olive oil, in a cold climate or in extremely cold weather, readily congeals, occasioning the annoyance of having to retrim the lamp, owing to the charring of the wick, which is a natural consequence of exposure, this is not the case with petroleum.

From the latter, also, a perfect, steady, uniform, bright, intense, white light is obtained, and as a lighting agent, there can be no question it is, next to gas, the most economical light, which can be produced. Care should, however, be taken to select the description of lamp best suited to the use of petroleum. It may be mentioned that oil lamps generally have been greatly improved of late years; and many ingenious contrivances for using petroleum as an illuminating agent have been introduced, known by different names; but the great principle involved is that of producing as perfect a combustion of the oil as possible, by carrying and circulating rapidly a column of air in the interior of the lamp to the flame. In carrying out these various plans, a great and important stride has been made towards the best and cheapest light. Some care should be taken in the selection and management of the wicks for petroleum lamps.

The defective burning of mineral oil lamps most frequently arises from the use of damp wicks. Cotton, like most vegetable fabrics, readily absorbs from 1-6th to 1-5th of its weight of moisture from the atmosphere; this prevents a free ascent of the oil, and causes a charring of the wick, and the production of an imperfect flame. Hence it is exceedingly important that a new wick should be thoroughly dried before it is placed in the lamp. When it has once been saturated with oil, the further absorption of moisture is impossible. We find that petroleum is getting into use for signal lamps at railway stations. Mr. J. Turner Hall, gas engineer to the London and Northwestern Railway Company (Edge Hill Station), was the first to direct attention to mineral oils for signal purposes, and the lighting of stations; and having made long and careful experiments, has succeeded in making the first signal lamp and lantern, in which petroleum can be used, and from which a perfect, steady, and uniform light can be obtained, even when the lamp is brought into contact with gusts of wind.

Mr. Hall's lamp is also well adapted for lighting coal and other mines, lighthouses, and other similar places. His system is now in use at several stations on the London and Northwestern line, and it seems to the writer so admirably arranged, and such an excellent, cheap, and desirable substitute for olive oil (which has been used for such purposes, since the first railway was opened), as to entitle it to be included within the circle of those modern inventions which have so simplified and cheapened the aids to safety, comfort and economy.—*Sanitary Reporter.*

COKE OVENS.

At a recent meeting of the British Institution of Civil Engineers, M. Pernolet, of Paris, read a paper "On the means of utilizing the products of the distillation of coal, so as to reduce the price of coke."

The author believed that this question had been practically solved, by the employment of existing ovens, to which certain inexpensive additions were made, and which, still giving to the coke all the solidity, density, and lustre that distinguished good coke made in the ordinary way, enabled every product of the distillation of coal to be turned to account. This was effected, mainly, by keeping the coal from all contact with the air during its distillation, by performing that process very slowly, and by collecting and making use of the volatile products. The whole arrangement had been sanctioned by many years' experience, both in Belgium and France, where it was actively and profitably pursued at ten different establishments, with more than four hundred ovens, of the largest dimensions, capable of receiving from five to seven tons of coal at each charge.

In converting an old oven into one of the improved form, the floor was taken up and raised about a foot, so as to allow of its being heated from below, by means of a fire-grate and flues. A new opening was made in the roof, in which was fixed a pipe, intended to receive the volatile products, and to conduct them to their destination. The ordinary door and the other opening at the top were so arranged that they could be kept hermetically closed. A chimney was also added to the masonry of the old ovens, and this was an essential part of the system, as it secured the circulation of the products of distillation. It has been ascertained that this chimney should be 50 feet high, and not less than 3½ feet square, inside dimensions, for a group of sixteen contiguous ovens; and that the sectional area of the main flue, connecting the different ovens with the chimney, should be three-fourths that of the chimney. In order to try whether the distillation was finished in any one oven, a valve was closed in the outlet pipe; when, if the charring was incomplete, the gas still given off would cause cracks in the loam, with which the joints of the door were closely

luted, and thus the necessity for continuing the process was demonstrated, The valve was then simply re-opened, so as to allow the gas again to pass off by the pipe. If, on the other hand, when the valve was closed, no gas escaped at the joints, the charring was known to be finished, and the coke was fit to be drawn. During this operation the valve was closed, to prevent the mixture of the external air with the gases circulating in the outlet pipe, and the cast-iron cover of the opening at the top was kept shut, to avoid the risk of igniting the coke by the draft of air which would be created if it was open. Tne oven was arranged for charging from the top by means of wagons running upon rails, and in this way five tons of coal could be introduced in fifteen or twenty minutes, a rapidity which was most desirable for preserving the heat of the oven. When the charge was being withdrawn and replaced, the gas from the other ovens was allowed to pass continually into the fire-place, so that the floor was kept hot, and the gas accordingly began to show itself, above the opening at the top, only a few minutes after the closing of the door. This opening was then hermetically sealed, and the valve in the outlet pipe being raised, the communication was re-established between the interior of the oven and the great common flue. The products of the distillation were drawn off by the draft of the chimney, together with the condensation of the liquid, and the cooling of the gaseous products. After circulating in the great general flue, the products penetrated into the condensing apparatus, where they deposited most of the tar and ammonaical liquor, and returned to the ovens by the small general flue, whence the gas, purified and dried, passed to each fire.

The time occupied in charring varied with the nature of the coal, and the density desired for the coke, and with the arrangement of the oven. At St. Etienne it took upwards of seventy-two hours, with rich coals, while at Torteron the time occupied was only twenty-four hours, with the rather poor but flaring coals of Commentry.

As to the cost, it was stated that the expense of altering each oven at St. Etienne wasabout £20, and that as the value of the additional yield from each oven ought to be about £60 per annum, this outlay should be repaid by four months' work.

It was asserted that the supplementary products due to these arrangements were, a larger yield of coke, and all the tar, the ammoniacal liquors, and the gas, which would be obtained from the same coals, if distilled in the retorts of a gas manufactory. Thus, in the great coke works at St. Etienne, the yield had been advanced from 58-8 to 69-3 per cent., and in the "Fonderies et Forges d'Alais," from 54-6 to 69-5 per cent. Generally speaking, with rich, or partially rich, coals, the increase in the yield of coke was from 10 to 15 per cent. As to the tar, the proportion collected depended on the nature of the coal, and on the care taken both in the distillation of the coal, and in the condensation of its volatile products. It had averaged 2-53 per cent. at the Forges d'Alais, 3 per cent. at Elonges, 3-25 per cent. at St. Etienne, and had reached as high as 5 per cent. from the ovens of the Paris Gas-Light Company, where only very bituminous coals were employed; but it was thought that there might be reckoned 3 per cent. of tar from the bulk of the coal distilled. The proportion of ammoniacal liquors depended also on the quantity of moisture contained in the coal; but it might be stated a weight of not less than 10lbs. of sulphate of ammonia, and sometimes it was as much as 13lbs. per ton of coal distilled. At the ovens of the Paris Gas-Light Company, from 10,000 to 11,500 cubic feet of purified gas were generally obtained from a ton of coal, which yielded from 69 to 70 per cent. of coke, fit for delivery to the railway companies.

It was specially resolved, that, in order to insure a fuller attendance of members than could be obtained on Whit Tuesday, the meeting should be adjourned until Tuesday evening, May 24th, when, it was announced that the following paper would be read, "On the Machinery employed in Sinking Artesian Wells on the Continent," by Mr. G. R. Burnell, F. G. S, and the last ballot for members for the present session would take place.

It was announced that the president's annual con versazione would be held on Tuesday evening, the 31st May, when the co-operation of members and visitors was requested, in order that a collection of models of engineering construction, and of specimens of work of art worthy of the institution, might be made.

INVESTMENT OF CAPITAL—GAS v. RAILWAYS.

There seems nothing like mining, banking, water, and gas companies as profitable investments. There is a kind of fascination about railways, and somehow or other £400,000,000 has been embarked in them; but, taking this large amount all round—ordinary stock, preference shares, and debentures—a poor 4¼ or 4½ per cent. is all that, on an average, is divided among investors, while some £20,000,000 of ordinary stock has gone for several years past without anything at all. Yet the public, thanks to the invention of preference shares and debentures, is always willing to find additional capital for railways every year, to the tune of £12,000,000 or £15,000,000; at any rate, it has done so for the last eight or ten years. Probably the reason for this is that, however well gas and water companies may pay, they afford but limited opportunities for the investment of capital. A railway company is of no importance which has not a capital of £5,000,000 to £10,000,000 engaged; and the London and Northwestern (now that it has absorbed the St. Helen's) has not far short of £40,000,000 embarked in its gigantic undertaking. But a gas company is a very powerful affair in its way if it has absorbed £800,000 or £1,000,000 in its enterprise. Of 13 flourishing metropolitan gas companies—the Chartered, the City of London, the Commercial, the Equitable, the Great Central, the Imperial, the Independent, the London, the Phœnix, the Ratcliff, the South Metropolitan, the Western, and the Surrey Consumers—the Imperial, had in 1862 only a total capital of £1,659,333, while the smallest, the Ratcliff, had embarked but £95,097. The 13 companies had raised between them only £5,783,815, but then they contrived to acquire in 1862—and there is no reason to suppose that their business became less profitable in 1863—a nett return of £558,403, or very close upon an average of 10 per cent. Yet the working expenses of the companies, taken *en somme*, bore in 1862 a considerable ratio to the rough receipts. Thus, while in 1862, the rough receipts of the thirteen undertakings were $1,840,969, the working charges amounted to £1,282,566, or somewhere about 70 per ct; while the working expenses of railways do not average more than 45 per cent. upon the traffic receipts. It is clear, then, that the secret of the relatively greater prosperity of gas as compared with railway undertakings lies in the moderation of what the French would call, by a happy phrase which they appear to have invented, "first establishment" outlay. To put our case in plainer words, while thirteen gas companies could, in 1862, earn a profit of £558,403, with an expenditure on capital account of £5,783,815, there is not a railway company which can be said to have acquired a similar profit with a capital expenditure of less than £13,000,000 or £14,000,000. This is clearly an explanation why gas companies pay thumping dividends, while some railways scarcely pay at all, and those are accounted prodigies which contrive to distribute six or seven per cent.

The gas companies which we have mentioned are excellent friends of the coal-mining interest, having consumed among them 882,491 tons of coal in 1861, and 848,979 tons in 1862, these totals being made up as follows:

Company.	1861.	1862.
Chartered..... Tons	147,695	123,213
City of London.....	57,032	53,430
Commercial.....	64,962	66,764
Equitable.....	35,609	38,868
Great Central.....	38,450	42,018
Imperial	243,585	227,865
Independent.....	43,695	35,535
London.....	75,260	75,531
Phœnix.....	71,971	81,930
Ratcliff.....	19,835	16,864
South Metropolitan...	30,695	37,271
Surrey Consumers	27,970	27,930
Western.....	25,732	27,254

We have headed these observations "Gas v. Railways," although in the matter of their necessary coal supply the companies named have not found railways rivals or enemies, but powerful and valuable allies and friends, as they have had the effect of ensuring deliveries at all seasons, and at a more uniform and moderate price. Railways also called screw colliers into existence, and put the shipping interest upon its mettle, while they have had the effect of breaking up monopolies, the only danger, perhaps, being that they may possibly become monopolies themselves. Further, railways have powerfully contributed to the general ease and well-being of the State, and, of course, gas companies have derived large benefits in consequence. In one respect railways figure badly, and the thirteen gas companies which we have mentioned come out very well. Thus the united expenditure of the whole thirteen for law and parliamentary charges in 1862 was only £2,698; in the same year, the London and Northwestern Railway Company alone expended £50,730. We never expect to see railways yield such a liberal interest as gas, still they would probably pay a little better if boards of directors were not so fond of engaging in worse than profitless litigation.—*London Mining Journal.*

YOUNG *v.* FERNIE.

All who take an interest in the mineral oil trade, and who have watched the progress of the tedious litigation in which Mr. Young has been involved, will join us in congratulating that gentleman on the result which we announce in another part of our impression—viz., unconditional judgment in his favor on all four issues, defendant paying all costs as they are taxed. It would be a subject of regret if this long-protracted lawsuit should be allowed to go by with the mere casual notice that Mr. Young had gained a verdict. The case involves other and deeper issues than the one ostensibly brought before the Court of Vice-Chancellor Stuart—issues with which the public should be made acquainted. To the end of making them obvious, let us just take a cursory survey of the chemistry, as well as of the business relations, of the important derivations obtained by Mr. Young as the result of his peculiar distillation. To begin, then, that gentleman has the merit of working up to a problem first propounded by Baron Liebig, and carrying it out to a practical solution. The renowned German chemist, in one of his books published now many years ago, expatiated on the advantages that would accrue to any inventor who might be fortunate enough to obtain the elements of illuminative gas condensed into a portable form, and make the result commercially available. Such, we say, was the problem that Mr. Young had to attack, and which he brought to a successful business issue. At this point arrived, we must pause in our narrative for the purpose of offering a chemical observation—one having a very intimate bearing upon the commercial merits of the case—one which the general public has very little understood. There is no paraffine in coal, schist, Boghead coal, or, in fact, any of the so-called paraffine and oil-yielding materials, notwithstanding that the above materials can be got from these things. It is a case of *eduction*, as contradistinguished from *production*—a result of which thousands of examples occur in the practice of every chemist. Oxalic acid can be got from sugar, though there is none in sugar; vinegar can be got from spirit, though there is none in spirit; prussic acid can be got from a beef-steak, though there is none in a beef-steak. All these are cases illustrative of eduction as contradistinguished from production, and are strictly comparable to the development of such things as parffine and paraffine oils from coals, schist, &c. Now, mark the following important point:—The precise results educed from a piece of coal, in the present case considered analogous material, when exposed to destructive distillation, vary according as the distillatory heat varies. If the heat be very high, the chief result of coal distillation is illuminative gas—itself a mixture of several gases, but of which we may affirm that the lower the distillatory heat employed, the better—that is to say, the richer—the resulting gas. lowering the heat still more, then do we find the gaseous results diminish in quantity, and certain condensible vapors take their places, amongst which condensible vapors are especially noticeable, those of actual paraffine, so-called paraffine oils, and a multi-

tude of liquid hydrocarbons, differing as to volatility and general qualities—liquids capable of being separated from each other to a great extent by fractional distillation.

Now, the practical question which suggests itself in reference to Young's claim in equity in this matter, is whether he was or was not the first who organized a workable, a commercial scheme for obtaining condensible matters of the nature of paraffine and paraffine oils from carbonaceous materials. Such, we say, is the plain, honest question, stripped of all technicalities, of all glosses, non-natural interpretations, and—to be short—of all mysticism. We do not doubt for a moment but that each and every one of Young's materials had been educed casually and, so to speak, at random, by various experimenters, not to say manufacturers; but to argue therefrom that the man who reduced the principles of eduction to a practical code, having specially aimed at accomplishing results that by preceding workers had only been accomplished casually—to argue that such a man, before a court of honor and in equity, should be awarded no credit, no recompense, for his expenditure of time and money—this, we say, is to sap the very foundations on which honor and equity are based. This, we are heartily glad to find, is the view the law takes of the matter. The result is not simply a matter of justice to Mr. Young, but the verdict may be accepted as furnishing the materials of a valuable lesson to parties who from many points of view contemplate the working of the patent laws. We need hardly call attention to the circumstance that just now the whole policy of letters patent is being questioned. The opposition began with Sir William Armstrong, who, petulant and vexed that he could not improve—if that be possible—the gun that bears his name, by using other people's patented inventions, began to attack the principle and operation of letters patent. Numerous people followed in his wake, amongst whom none in our estimation so mean and contemptible as a certain class of would-be purists who affect to regard the man of applied science—the manufacturer—with disdain; and to reprobate what they choose to call the "grasping monopoly of letters patent for invention." When we come to scrutinize these gentry more closely—to seek into their antecedents and general belongings—then, and not till then, does the full measure of absurdity implied by their professed purism become apparent. Who are these high-flown purists who affect to contemn science when applied to manufacture?—who reprobate monopolies, and would create a social feeling against men who have done no greater wrong than that of claiming on their own behalf, and securing a pecuniary reward, for time, and cash, and energy expended—who are they? Why, the recent trial will have revealed some of them. Mostly young men whose ambition for a learned title is so great and so honorable that they have been content to purchase degrees of philosophy in quarters where these titles can be had for the paying—where the fecundity of Doctor-breeding can best be compared to the spawning of toads in sewers. Of such sort mostly are the men who affect to snub chemical manufactures and to reprobate the system of letters patent. Let some of these gentlemen look to their own honor. Hairsplitting and trimming for the consideration of a fee is not the nicest occupation for a purist. In conclusion, we congratulate Mr. Young on the issue of his contest; and not only him, but manufacturing patentees. Circumstances have made a representative man of Mr. Young;—he stands forward not merely on behalf of himself, but of a class. The great question to be tried was whether mere casual priority on the small scale in such a case as his, should be held in law and equity to override the validity of a process elaborately reasoned out, organized with skill, and practised during many years up to a large commercial issue.—*London Grocer,*

THE CHICAGO LAKE TUNNEL.

The contractors are now rapidly pushing forward the work upon the eastward drift of the lake tunnel. They have penetrated nearly fifty feet under the lake, through a stiff blue clay, mixed with boulders of limestone, some of which are of large size. These stones, although offering but little impediment to the work of removing the clay, deteriorate it somewhat for the purposes of brickmaking. The machinery for the manufacture of bricks is now upon the ground, and preparations are rapidly being made to turn out the manufactured article as fast as they will be wanted by the masons.

In sinking the shaft, a jet of highly inflammable gas was met with, and when lighted shot up in a brilliant flame several feet in height. This was succeeded by flow of water, which has continued ever since, requiring about four hours pumping each day. This has not, however, proved a great disadvantage, as the well at the bottom of the shaft receives it all, and drains the whole site of operations.

The workmen are furnished with lamps which are fastened to their hats to light them at their work. As fast as the clay is loosened it is placed on a small car which runs on a railway track. It is conveyed to the bottom of the shaft and then hoisted. This subterranean transportation is effected by the use of mules, which are accommodated with quarters at the end of the tunnel west of the shaft. The work will now rapidly be proceeded with at the rate of between fifteen and twenty feet per day. The crib-work for the first lake shaft is in process of construction on the north pier and will be completed some time during the month of July.—*Chicago Times,*

PHOTOGRAPHS BY ARTIFICIAL LIGHT.—At the Society of Arts, Dr. Grace Calvert, F. R. S., in the concluding lecture of his course of Cantor lectures, called attention to the metal magnesium, and exhibited specimens of wire made from it, and showed the brilliant light which its combustion affords. This light is so intense, and possesses to so great a degree the qualities of sunlight, that photographs can really be taken of objects illuminated by it. At the conclusion of the lecture, several successful photographs were taken in thirty seconds, by M. Claudet, of Theed's bust of the Prince Consort, in the ante-room of the society's lecture-hall, the first ever taken in London by means of this illuminating agent. The manufacture of this metal, it was stated, had been undertaken by Messrs. Johnson and Matthey, who would shortly be prepared to supply the wire at the rate of 21s. per ounce, or a length of 120 feet.

PATENTS.

42,503.—Edward Pepple, New Carlisle, Ind., for a Windwheel Pump:

I claim the combination and arrangement of the shaft, D, wheel, M, brake-arm, P, and brake, N, in the manner and for the purpose set forth.

I also claim the general arrangement of the pump and windwheel, substantially as described.

42,534.—Caleb Goodwin, assignor to himself and J. C. W. Bailey, Chicago, Ill., for a Lamp:

I claim, First, The wick-tube, B, either corrugated or otherwise, so constructed as to admit of sundry air-passages extending from its lower part to the top, and discharging the air immediately at the base of the flame, substantially as and for the purposes set forth.

Second, The combination and arrangement of the wick-tube, B, the open burners, C, and the cone, A, when constructed and operating substantially as and for the purpose herein described.

42,598.—Louis S. Robbins, New York City, for preparing Barrels to contain Petroleum, Coal Oil, &c.:

I claim the combination formed by saturating the outer surface of the cask with heated oil, and the body of the staves and heads with soap suds or an alkaline solution, substantially as and for the purpose set forth.

42,609.—Joseph Todd, Madison, Ind. Ante-dated April 1, 1864, for a Gas-burner Socket:

I claim uniting the two pieces of the gas socket by means of a male and female screw thread, by which the elastic interior packing is rendered adjustable, substantially as herein described.

42,617.—Martin W. and John Zimmerman, Earl Township, Pa., for a Pump:

We claim the use of a single wire, in combination with the regulating screw y, burrs, v v, rocker shafts and arms, B H R, weights, L, operated by a water wheel and crank in the manner and for the purpose specified.

42,658.—Wm. H. H. Hinds, Groton, Mass., for a Lantern:

I claim the application to hand lanterns of a tube, B, to support the candle, D, and the spring, f, enclosed within the tube for the purposes herein described.

Also the standard P, and sleeve, E, for the support of the lantern, as above set forth.

42,669.—R. H. Lamborn, Altoona, Pa., for a Coal-mining Apparatus:

I claim, first, The arrangement and combination of the cylinder, D, with the truck, C, in such a manner as to give the piston rod, E (to the end of which the chisel is attached), an angle with the face of the coal, the force of the blow given by said piston rod being regulated by the connection of said rod with cross-head, L, valve rod, I, and adjustable stops, e f, as set forth.

Second, In combination with the foregoing, I claim the sectional tracks, constructed, secured, and employed as and for the purposes herein specified.

Third, The combination of wheel, h, pinion, g, and cog-wheel, B', with the sectional tracks constructed as herein described, to give the necessary forward movement to the truck by their connection with valve rod, I, and lever, K.

Fourth, The employment in an apparatus such as described of the exhaust air or steam to keep the channel clear of chips and dust, in the manner described.

42,671.—Sylvester Lewis, Rochester, N. Y., for Deodorizing Petroleum, &c.:

I claim the use and application of the above ingredients, to wit, ashes and charcoal for the purpose of deodorizing petroleum and and kerosene oils, naphtha, benzone, and benzine, and the process of filtering the same through the above ingredients, as above set forth, without reference to the exact proportions of such ingredients, which vary somewhat, depending upon the state of the oil to be deodorized.

42,679.—John C. Morris, Cincinnati, Ohio, for an Apparatus for raising Water:

I claim the shield, D, for the purposes specified, in combination with the general arrangements, all substantially as and for the purposes set forth in the foregoing specification.

42,681.—J. P. Nevens, Stark, Maine, for a Pump:

I claim the combination of the inlet ports, e e', and outlet ports, f f', with the oscillating plunger, B, pump-box, A, and stock, D, all constructed and operating as and for the purposes shown and described.

42,686.—Andrew J Reynolds, Sturgis, Mich., for a Double-acting Submerged Pump:

I claim the cylinder, A, provided with the two ball valves, B and C, in combination with the water passages, D D and d, all arranged to operate in connection with a double-acting hollow discharging piston, as and for the purposes herein set forth.

42,693.—William Sewell & Adam S. Cameron, New York City, for a Pump Valve:

We claim providing or making an India-rubber or other gum valve with a disk of metal or other hard material adapted by coming in contact with the valve seat, or with a suitable guard, to limit or prevent the forcing of the gum into the aperture of the seat, substantially as herein described.

42,694.—William Sewell & Adam S. Cameron, New York City, for a Direct-action Steam Pump:

We claim, first, The combination in direct-action steam pumps, of the separate steam and water piston rods, C D, having a detachable connection with the rock-shaft, H, and the extensible arm, G, or its equivalent, for connecting the said rock shaft with the water piston rod, substantially as and for the purpose herein specified.

Second, The socket, E, connecting the steam and water piston rods for working the pump by steam, and serving as a guide to the water piston rod in working the pump by hand, substantially as herein described.

42,705.—John Warren, Buffalo, N. Y., for Pumps for deep Wells:

I claim, first, Two or more valve pistons operated within the tube or pump barrel, when so placed or arranged that, in the up stroke, the liquid to be raised will be divided into equal columns (or nearly so), and the hydrostatic pressure thereby lessened, and so that each valve piston will be required to do an equal proportion of the work, substantially as described.

Second, Constructing and operating the valve pistons so that the valve of the upper piston will close first, and the valve of the second piston immediately after, and so on through any number of pistons which may be used, substantially as and for the purposes specified

Third, The construction of the combined valve and piston, C, consisting of the hollow cylindrical part, C', provided with perforations, C5, at the bottom, and openings, C6, at the top, and sleeve, C2, operating for the purpose and substantially as set forth.

42,708.—W. Whitney, Manchester, N. H., for a Water Wheel:

I claim, in connection with the peculiarly shaped floats, F, the inverted conical centre, E, and hoop, G, to which the floats are fastened.

In connection with the concave disk or basin around the wheel, I claim the stationary guides, L, and shutes, M, to direct the water on to the wheel, substantially as described.

I claim the cylindrical gate, N, arranged between the curb and the wheel, and fitted to traverse circularly around the wheel, and open and close the shutes or apertures which supply water to the wheel.

42,717.—Chas. W. Siemens, London, England, and Frederick Siemens, Berlin, Prussia. (Patented in England, Jan. 22, 1861,) for a Gas Producer or Furnace:

We claim the gas producer, constructed in manner and so as to operate substantially as described.

42,724.—G. E. Donisthorpe, W. Firth and R. Ridley, Leeds, England. (Patented in England, Nov. 26, 1861,) for a Coal-mining Apparatus:

We claim, first, The combined arrangement of mechanism herein explained, with reference to figures 1 and 2 of the drawings, whereby picks with lever handles are actuated by compressed air engines, mounted on and carried by the same carriage as the picks.

And, secondly, We claim the combined arrangement of mechanism herein explained, with reference to figures 4 and 5 of the drawings, whereby cutters are connected with and moved to and fro by the piston-rods of air engines, mounted on carriages, as herein described.

42,765.—John O. Harris, Reading, Pa., for a Lamp Burner:

I claim the combination of the wick tube, B, plates, C C, wings, D D, and jackets, E F, arranged and operating substantially as and for the purposes described,

42,771.—John Howarth, Salem, Mass., for a Process of Making Illuminating Gas:

I claim bringing superheated steam and liquid hydro-carbons in contact with each other in such a manner as to vaporize the latter, and then passing the two vapors thus formed and combined through heated, dry, carbonaceous material, as set forth.

42,772.—John Howarth, Salem, Mass., for Apparatus for Distilling-off Gases and Vapors:

I claim so combining devices for superheating steam flues for the passage of products of combustion, and a suitable retort or retorts containing carbonaceous materials, as to cause the internal heat, or that produced by the superheated steam, to always predominate over the external heat, and perform the work of extracting the liquid and volatile products from the retort or retorts without producing distructive distillation, substantially as described.

I also claim the double-chambered upright retort, arranged and operating substantially as described and for the purpose specified.

42,773.—Benjamin J. C. Howe, Syracuse, N. Y., ante-Feby. 4, 1864, for a Double-acting Pump:

I claim a hollow-piston-rod, having one or more apertures near the lower end, and attached to the piston in such a manner that the apertures in the side of the hollow piston-rod shall be open only to the compressed water on either side, alternately, of the piston as it is moved backward and forward in the cylinder of the pump, substantially as described.

42,803.—Robert M. Smith, Baltimore, Md., for a Mode of utilizing the Waste Acid from Petroleum Refiners:

I claim the utilizing of the sulphuric acid that had been previously used for refining petroleum or coal oils, and which contains foul and noxious odors, by applying the acid in the manufacture of salts of various kinds, and burning out the oil or fetid matter, substantially as herein described.

43,025.—Albert H Hook & J. Henry Darlington, New York city, for coating Barrels to render them Oil-tight:

We claim saturating wooden vessels, as and for the purposes herein-above set forth.

We also claim in combination therewith, the manner of stopping the bung-hole.

43,039.—Dewey Phillips, Shaftsbury, Vt., for a Water Wheel:

I claim, first, The conductor, E, formed circular at one end and rectangular at the other end, in combination with the cylinder, H, sluice, S, and gate, g, for the purposes, and as specified.

Second, I claim the band of leather or other flexible material surrounded by the ring, w, and kept to its place by the ring, u, and adjusting screws, in combination with the cylinder, H, and wheel A, or disk, K, for the purposes specified.

Third, I claim the safety valve, V, in combination with the gate, g, the said valve being near the gate, as and for the purposes specified.

Fourth, I claim the combination of cylinder, H, sluice, S, chamber, G, and water passages, A, in the manner and for the purposes specified.

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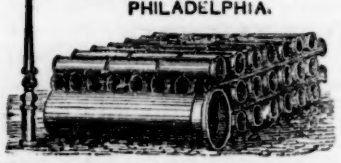

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Photometers, Pressure Registers, Indicators, and Gauges, Governors, Meter Provers, Centre Seals, Fluid Gauges, &c.
GAS APPARATUS
Of the most reliable and approved construction manufactured and on hand at the
UNION GAS METER WORKS.

H. R. WORTHINGTON'S
PATENT WATER-METER.
This Meter combines
ACCURACY, SIMPLICITY, and
REMARKABLE DURABILITY,
with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.
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THE AUBIN
GAS-WORKS COMPANY,
Of Albany, N. Y.,
Now contract their works to make 10,000 feet of good Gas from 2,000 pounds of *hard* wood and 40 gallons of kerosene tar, *before payment can be demanded;* and the charcoal is worth the cost of the wood.
Many Village Gas Companies can be referred to.

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GAS ENGINEER
And Contractor for Coal or Oil Gas-Works.
Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.
To Manufacturers of Petroleum Gas.
For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.
Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

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Gratis and post free, "The Inventor's Manual," also a pamphlet, "L'Obtention de Patentes Anglaises," 500 Mechanical Movements; the first part of Kinematics, or the Transformation of Motion, by Joseph Willcock, C. E., Mem. Soc. of Eng. May be had at the above address, and of any bookseller. Price 2s. 6d.
The second part is approaching completion and will shortly be announced.

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Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers &c., &c.

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For Lighting and Heating Purposes.
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THE ALPHA TUBE WORKS
WALSALL, STAFFORDSHIRE, ENGLAND,
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LAMBERT BROTHERS,
MANUFACTURERS OF
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PATENT ECONOMIZING
GAS-BURNERS,
Regulated to burn without noise or fluttering at sixth-tenths to eighteen-tenths pressure. Last twenty Scotch tips. Price from 8s. to 40s. per gross; liberal allowance to wholesale buyers. Any size for any gas (coal, wood, or cannel) screw either taper s/8, s/4, or plug.

500 Tons Cast-Iron Water-Pipes Wanted.
OFFICE OF THE BOARD OF PUBLIC WORKS,
CHICAGO, Ill., May 25th, 1864.
SEALED PROPOSALS WILL BE received at this office until 11 o'clock, A. M., Saturday, June 4th, for FIVE HUNDRED TONS of 4, 6, and 8 INCH WATER-PIPES, to be delivered at the dock of the Board, in Chicago, on or before October 1st next, according to specification on file in this office, copies of which will be furnished, if desired.
The pipes may be in lengths of 9 feet or 12 feet, but the length of 12 feet will be preferred. For 9-feet pipes the weight will be, respectively, for 4, 6, and 8-inch pipes, 220 lbs., 330 lbs., and 450 lbs., and for 12-feet pipes in proportion.
Bids must be directed to the Board of Public Works, endorsed "Proposal for Water-pipes."
The Board reserves the right to reject any or all bids.
J. G. GINDELE, FRED. LETZ, O. J. ROSE, } Board of Public Works.

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OFFERS FOR SALE
GAS-LIGHT STOCKS
In all the leading Companies.

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Particular attention given to the negotiation of GAS-LIGHT and WATER COMPANIES SHARES and BONDS.

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MANUFACTURERS OF
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And every description of
GAS FIXTURES,
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MANUFACTORY,
Nos. 335, 337, 339, 343 WEST 24TH STREET,
New York.

"HER MAJESTY"
CHAMPAGNE.
THE ROYAL WINE OF ENGLAND.
A limited quantity of this delicious and superior Wine has been secured for the undersigned, and the first shipment of 500 cases has arrived this day, by the steamship "Olympus," from Havre.
It comes direct from the cellars of the well-known house of Messrs. DE VENOGE & CO., at Epernay, France, and the present invoice will be introduced into this market at the very low price of
Twenty Dollars per Case of Quarts.
Payable in currency, which is much below its actual first cost.
The superior quality of this Wine is guaranteed, and it is offered with every confidence of its entire approval by connoisseurs, and lovers of a fruity, full-body wine.
Orders for one or more cases may be addressed, by letter or otherwise, to the undersigned,
WM. HENRY WARD,
WINE AND FRUIT DEALER,
Quarts, $20. No. 7 Broad st., near Wall,
Pints, $22. New York.

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PATENT
NON-FREEZING & NON-EVAPORATING FLUID,
For Filling Wet Gas-meters,
AND
Far Cheaper than any other Meter-fluid in use.
WARRANTED
Not to corrode tin, iron, brass, zinc, or drum-metal.
To be less injurious to wet meters that water.
Not to freeze at 20 degrees below zero, Fah.
Not to evaporate when in use in the meters, meters once filled with it requiring no further attention whatever for years.
The summer is the proper time to fill them.
SIX YEARS OF SUCCESS!
Five years in general use in works using it, to the exclusion of all other fluid, and driving the dry meter out of use, enables us to recommend our patent with perfect confidence.
For information and references, apply to
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THE GAS-POWER ENGINE,
MOTEUR LENOIR.

Messrs. BARRETT, EXALL & ANDREWES

Having made arrangements with the proprietors of the above valuable Patent, on terms which must command its introduction into Great Britain and her colonial dependencies, are desirous of at once arranging for the formation of a Company under the Limited Liability Act.

Believing that the value of the Patent to Gas Companies cannot be over estimated, and that it is destined to occupy a sphere in powers which, though enormously extensive, have never yet been worked; and believing also that the Gas Companies should have the first opportunity of possessing it, Messrs. B. E. and A. will be happy to receive any communications with a view to that result before they introduce it to the public.

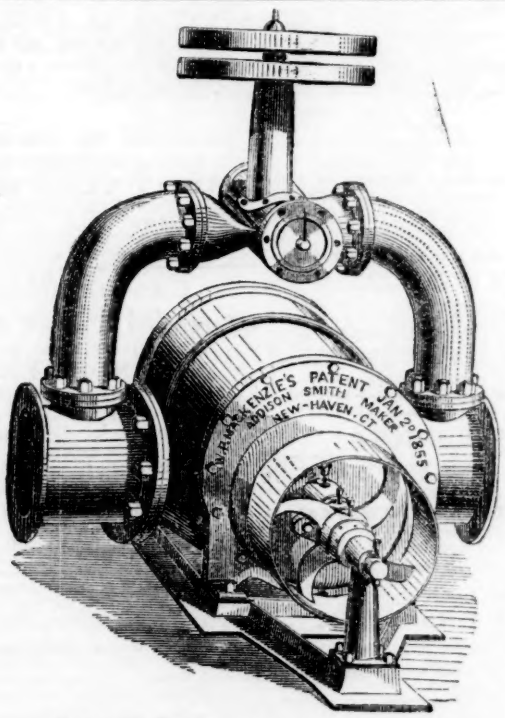
The manufacture will be at once commenced with the 3, 2, 1, and ½ horse powers. They are in form like a horizontal steam engine; require no boiler, chimney, or expensive setting; are elegant in appearance, perfectly clean, free from smell, and can be set to work at a minute's notice—the cost ceasing when they are at rest.

THEY ARE ABSOLUTELY FREE FROM DANGER,

either from explosion or fire, and require the minimum of attention.

Address as above, at

Kato's Grove Iron Works, Reading, England.



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Sole Proprietors and Manufacturers of

THE MACKENZIE PATENT GAS EXHAUSTER

AND

PATENT COMPENSATOR.

They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. uel. Address SMITH & SAYRE, 458 Broadway, New York.

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PRACTICAL GAS METER MANUFACTURERS,

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STATION, EXPERIMENTAL AND SHOW METERS,
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GOVERNOR AND CENTRE SEAL DRUMS,
FLUID AND PRESSURE GUAGES,
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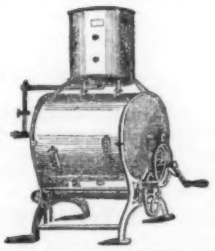
DRAKE'S

PATENT

AUTOMATIC GAS MACHINE.



THIS MACHINE, which has been in constant use for more than two years, is now acknowledged to be the

Most Convenient,
Simple, and
Efficient Method

OF LIGHTING BUILDINGS OF ALL KINDS, out of the reach of regular gas-works, ever brought to public notice.

The SIMPLICITY OF THE APPARATUS, its ENTIRE FREEDOM FROM DANGER, the LITTLE ATTENTION REQUIRED, the EASE WITH WHICH IT IS MANAGED, and THE CHEAPNESS and SUPERIORITY OF THE LIGHT, has gained for it the favorable opinion of those acquainted with its merits.

The Machine takes up but little room; no disagreeable odor is experienced in its use; no fire is applied to the apparatus at all; it can be attached to ordinary gas-pipes used for coal-gas, and is burned through the same kind of fixtures.

These Machines are manufactured in Boston, by the AUTOMATIC GAS-MACHINE CO., and are for sale at their Store, 78 Washington street, Boston, and also at the Agency, MITCHELL, VANCE & CO.'s, No. 620 Broadway, New York.

For further particulars, address—

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PRINCE'S METALLIC PAINT,

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. It prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though sold at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, rouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Four Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

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Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice.

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NEWSPAPER WRAPPERS. Mara's Patent Self Sealing and Folding Water-lined Newspaper Wrappers. Manufactured only by

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Envelope Manufacturer,
No. 77 White st., near Broadway, N. Y.
And sold by all booksellers in the United State

ROBBINS' PATENT GAS AND WATER JOINT.

THE PROPRIETORS of this unrivalled joint are now prepared to introduce it to general use, and to guarantee that, in all respects, it will fulfil perfectly all the requirements of either water, gas, or steam. It is a joint which remains in all situations absolutely tight.

The following illustrations, with the appended explanations, will give a good idea of the improvement:

Fig. 3.

Fig. 1.

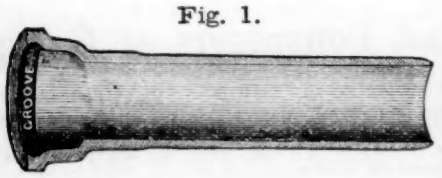


Fig. 2.

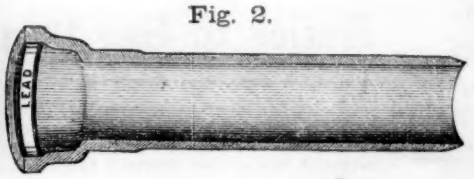


Fig. 4.

FIG. 1. Is a sectional view of a pipe showing a groove to receive a lead ring.

FIG. 2. Is a sectional view of a pipe showing a lead ring in the groove.

FIG. 3. Represents a former, which is used in the bell end of the pipe while casting the lead ring. Before using the former, however, a strip or belt of India rubber is first inserted in the socket, against which the former rests to prevent the lead escaping from the groove while being cast. Upon the cooling of the lead, the former and rubber ring are withdrawn from the socket, and the lead ring is left projecting inwards from the groove all around, forming an indestructible packing to receive the spigot-end of the pipe.

FIG. 4. Shows two pieces of pipe in connection with an hydraulic jack, by which the spigot-end of the pipe (which is cast tapering and may be cast in a chill), is forced into the lead ring in the groove which perfects the joint. A, represents the jack; B, B, the chains by which the pipes are drawn together; and C, C, pieces of pipe.

This ring joint packing may be cast at the foundry or any convenient place, and when delivered at the ditch, may be laid, and perfect joints formed, by any laborer, above or below the surface, or in ditches filled with water, there being *no joint ditching required*, and it can be laid with very great rapidity.

Among the economies realized by this joint may be enumerated, the saving in the weight of the pipe, in the amount of lead required to be used in forming the packing, in the labor of ditching, and in laying the pipe.

The bell or socket may be cast one-half the usual length, as the width of the groove requires, but from a half to one and a half inches, according to the size of the pipe, thus saving in the total weight about two hundred pounds per ton.

The weight of lead required to form this joint, as compared with the amount of lead used in forming a joint according to the old method, is fully seventy-five per cent. less, only so much being required as to maintain the compensating principle, or enough to allow (upon the raising or depressing of the line of pipe out of a direct line) what is lost upon one side of the ring packing, to take its place upon the other; thus securing flexibility of the joint without affecting its reliability. The use of yarn or hemp packing is dispensed with, the cost of which is an entire saving as compared with the old method of making joints.

The saving of labor in ditching is the total amount usually expended in digging joint-holes, there being *no joints to be caulked.*

The saving in labor in laying pipe furnished with this joint is a sum equal to the whole cost of carrying lead, fuel, ladles to the ditches, casting the lead, bailing out water, and the entire labor of caulking, less only the sum charged for casting the lead ring packing at the foundry, which is comparatively trifling. This last-mentioned economy has been estimated by the best engineers at seventy-five per cent., or the same as the saving in the quantity of lead used.

The cost of pipe cast from our patterns is the same per ton as pipe cast for the old form of joint. The principal iron-founders propose to charge the same price.

We have submitted these joints in water-pipes to a pressure of two hundred and fifty pounds to the square inch, and they have remained perfectly tight. It has also been submitted for months in gas-pipes to the ordinary pressure of our city gas-mains, without any leakage whatever. We are aware that these statements may be deemed by many extravagant, but the merits of the improvement warrant them all, and the most skeptical may be fully convinced by an investigation of its value, and by witnessing the tests to which we submit it, or by its use under any conceivable circumstances.

TESTIMONIALS.

OFFICE OF THE WATER COMMISSIONERS,
CITY HALL, JERSEY CITY, October 14th, 1863.

Dear Sir,—On the 26th of May last, about two hundred and sixty feet of cast-iron water-pipes, six inches in diameter, with joints constructed according to your invention, were laid for the Jersey City Water-Works, in Prospect street.

The operation of uniting the joints of the pipes, was performed with remarkable facility, and with an important saving in time, materials, and labor. The joints proved perfectly water-tight, after turning the full head of water on the pipes.

In my opinion, your invention has proved entirely successful, and will be found highly beneficial to water companies.

Yours, respectfully,
ROBT. C. BACOT,
Superintendent and Engineer, Jersey City Water-Works.

MR. R. C. ROBBINS.

ENGINEER'S OFFICE, CROTON AQUEDUCT DEPARTMENT.

Dear Sir,—I have examined your plan for making joints in cast-iron water pipes, and have a report from one of my assistants, of certain experiments made by you, to prove the certainty and economy with which the joints can be made, and their stability when finished.

I think the experiments showed that the joints could be made quite as rapidly, if not more rapidly, than those made in the ordinary method now in use; the quantity of lead used was less than that required in the common joint, and no yarn packing was required. In these respects, your joint seems superior.

After the joints were made, a pressure of three hundred pounds to the square inch, was put upon the pipe in such a manner as to test the efficiency of the joint to prevent both leakage of water, and separation of the pipes from each other longitudinally. This pressure failed to produce either leakage at the joint, or separation, so long as the pipes lay in a direct line; but on deflecting them six and a half inches, in a length of twelve feet, the joint commenced leaking. It is fair to add, that this is a greater deflection than would often be found necessary in laying pipe.

I think the efficiency of the joint in both the points tested in this last experiment, might be increased by increasing the quantity of lead, both in thickness and width.

Altogether, the result of the experiments was such that I have determined to make a more thorough est of your invention by putting down about one thousand feet of pipe, when we commence our operations for the coming season.

The diameter of the pipe subjected to experiment, was six inches, and is the same size that I propose to put down next year.

I am, very respectfully, your obedient servant,
A. W. CRAVEN, Chief Engineer, &c.

To R. C. ROBBINS, Esq., Jersey City.

METROPOLITAN GAS-WORKS,
ENGINEER'S OFFICE, NEW YORK, October 9th, 1863.

Dear Sir,—The undersigned had the pleasure of being present at an experimental test of your patent joint for gas and water pipe, made at the yard of the Croton Aqueduct Department, and cheerfully testify to the results obtained, namely:

First experiment was made with two lengths of eight-inch pipe, jointed together, when a pressure of three hundred pounds to the square inch was applied. This pressure did not force the pipe apart, nor start the joints, but they remained, during this experiment, perfectly tight.

Second experiment was made by deflecting the pipe five inches, which is about equal to eighteen inches in one hundred feet, and the same pressure applied, which caused a small leak at the joints.

Third experiment was made by taking the pipes apar and rejointing them, when the same pressure was applied when lying straight and when deflected; at this experiment there was no leakage.

From these severe tests it is my impression that the superiority of your patent joint has been made manifest, and that it must eventually supersede the old way of jointing pipes together, saving both time and material.

Wishing you success in your enterprise,

I am, very respectfully, yours, &c.,
AMBROSE J. WHITE, Engineer.

To R. C. ROBBINS, Esq.

OFFICE OF THE METROPOLITAN GAS-LIGHT COMPANY,
NEW YORK, October 9th, 1863.

Dear Sir,—Having been present at the testing of your patent joint for gas and water pipe, at the yard of the Croton Aqueduct Department, I can testify to the results as stated by Col. A. J. White and fully concur with him in the opinion expressed in his letter to you of this date.

Very respectfully, yours,
W. TITUS, Secretary.

R. C. ROBBINS, Esq.

NEW YORK, October 23d, 1863.

Gentlemen,—I am pleased to be able to inform you, that we are fully satisfied that we have done well in adopting your "Improved Joint," in the construction of an aqueduct which we are now building on Oil Creek, Northwestern Pennsylvania.

We have ten miles of three and four inch pipe to lay this season, and, in our estimation, the perfection of the joint, economy in lead, and rapidity with which the pipe can be laid, render it entirely preferable to any other method of laying pipe.

Our Mr. Hutchings advises us that he is putting down the three and four inch pipe at the rate of twenty-five to thirty lengths per hour, with two men in the trench. We are much pleased with this result.

Respectfully yours,
HUTCHINGS & FOSTER.

Messrs. R. C. ROBBINS & Co.

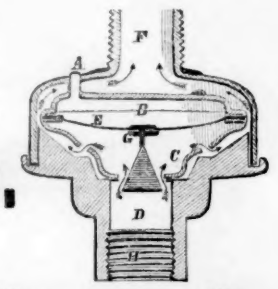
For further information, or for prices and terms, which will be very reasonable, apply to

R. C. ROBBINS & CO.,
No. 218 FULTON STREET, NEW YORK.

THOMPSON'S

PATENT

AUTOMATIC GAS CONTROLLER.



Notice to Gas Companies and Consumers of Gas generally.

WE RESPECTFULLY INVITE YOUR ATTENTION TO THE FOLLOWING TRUTHFUL DESCRIPTION OF THE construction and operation of this recent and most important invention; its application to every street lamp, and on the fixtures within the works of the Gas Companies, as well as for the use of the general consumer, will be found to effect perfectly and reliably, the object so long sought for, viz.: **a perfect control of the Gas under varying pressures, emitting the Gas at the burner without force, and without increase or diminution of quantity, and hence promoting the highest possible illuminating power of the Gas.**

THE AUTOMATIC GAS CONTROLLER

Is designed to occupy the place of the gas-burner. Within the circumference of a small cylinder, below the burner, is placed a conical valve, attached to a movable diaphragm, the valve and valve seat is proportioned, so that under a supply of Gas, varying in pressure from four-tenths to five inches, the burner will continue to produce the same consumption and development. The unerring accuracy of movement of the Diaphragm at every change of pressure, whether gradual or sudden, and its positive control of the valve which admits, by its proportionate increased or diminished aperture, the same unvarying amount of Gas, has elicited the unqualified approbation of engineers and other experts in the profession.

The simplicity of its construction, and materials used, are a sure guarantee of its durability and continued successful operation. They afford to the consumer of Gas the advantage of a **superior light, with the greatest possible economy**; and for the Gas Company, they control the Street Lamps, affording a more satisfactory light for the public, without waste.

The public are invited to witness its operation, at the Office of the Company; and samples will be sent to Gas Companies for experiment, on application by letter or otherwise.

G. W. THOMPSON & CO.,

Office, 52 GREENE ST., (up stairs.)

A. L. BOGART, AGENT, 592 BROADWAY,

New York.

We are permitted to refer to the following Gentlemen, who have thoroughly examined our Gas Controller:

GEO. H. KITCHEN, Inspector of Gas Meters, 561 Broadway.
CHAS. ROOME, President Manhattan Gas Company.
J. H. ADAM, President New York Gas Company.
PETER COOPER, Cooper Institute.
JOHN A. DUFF, Olympic Theatre.

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Organized under the General Manufacturing Laws of the State of New York.

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SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS and REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy, and excellence of workmanship. Orders addressed

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ARCH AND TWENTY-SECOND STREETS, PHILADELPHIA,
1 BARRETT STREET, BOSTON, will meet with prompt attention.

STEAM-PUMPS.

WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies. For Sale at greatly Reduced Prices.

Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

Patent GATES, for Water and Steam-stops.

HENRY R. WORTHINGTON,
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WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.

J. D. WEST & CO.,
179 BROADWAY, N. Y.

GEO. H. KITCHEN & CO.,

NEW PATENT

GAS APPARATUS

For Country Residences, Public Buildings, &c.,

FROM $300 UPWARDS.

EVERY DESCRIPTION OF GAS FIXTURES.

Gas Fitting in all its branches.

561 Broadway,
NEW YORK.

TO GAS COMPANIES.

THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.

CHAS. M. CRESSON,
Late Asst. Engineer of the Philadelphia Gas-works,
417 Walnut st., Philadelphia.

ANALYTICAL CHEMIST

C. ELTON BUCK,

Analytical and Consulting CHEMIST,

39 NASSAU STREET, NEW YORK,

Analyses of Ores, Minerals, Soils, Guanos, Coals, &c., and Tests of Commercial Articles, carefully and promptly made. Consultations may be had, and opinions given on Chemical questions. Samples for analysis from a distance, may be sent by mail or express, directed to the Laboratory as above.

GLYCERIN

FOR

Filling Wet Gas-Meters,

Cheaper than Whisky or any other substance.

We have furnished the Cincinnati Gas and Coke Company 300 barrels Glycerin, for filling their wet meters, and are now ready to supply other Gas Companies at the lowest cash prices.

We warrant our Glycerin not to corrode the meter metal, nor to freeze at the lowest ordinary temperature, nor to evaporate.

HARTMAN & LAIST,
Manufacturing Chemists,
Cincinnati, O.

Office 64 Sycamore.

NEW YORK FIRE-BRICK and Clay Retort Works. (Branch Works at Kreischerville, Staten Island.)

B. KREISCHER, office 56 Goerck street, corner Delancy street, New York.

GAS RETORTS, TILES and FIRE-BRICK of all shapes and sizes. FIRE MORTAR, CLAY, and SAND. Articles of every description made to order at the shortest notice. B. KREISCHER.

WOODEN PURIFYING TRAYS.

PATENT

Conically Slotted Solid Wood Sieves

FOR GAS PURIFIERS.

CAUTION

TO

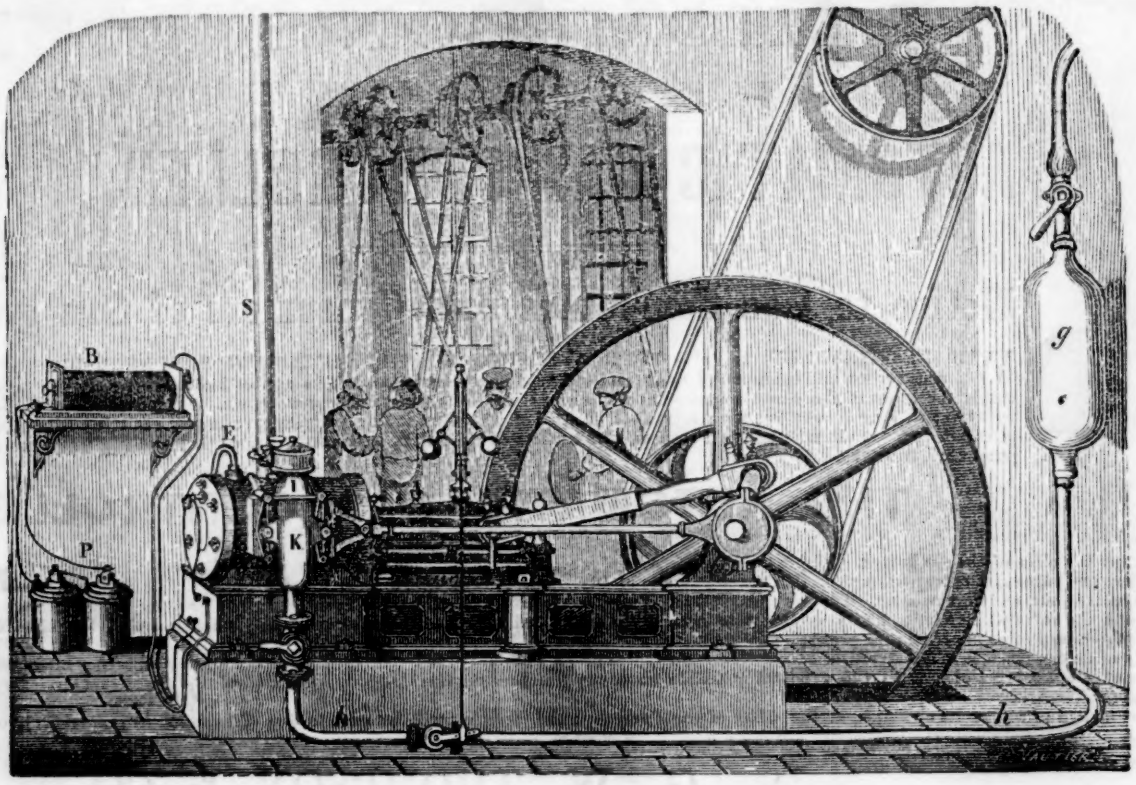
GAS MANUFACTURERS.

The Conically Slotted Solid Wood Tray was patented 21st October, 1862, by N. O. Hawxhurst, assignee of Wm. Combe, and all persons are cautioned against purchasing such trays of R. G. Hunt, or any other person except the subscriber, as it is a direct infringment of said patent. The following companies are now using these trays.

Manhattan, New York,
Williamsburgh,
Brooklyn,
Albany,
Baltimore,
Philadelphia,
Chicago.
Louisville,
And numerous others.

Orders received by mail or otherwise.

JOHN L. CHEESMAN,
147 Ave. C, New York City.



MOTEUR—LENOIR.

LENOIR GAS ENGINE.

This is a horizontal engine, in which a piston, by a connecting rod drives a horizontal shaft.

The gas enters by the pipe "h" from the regulating reservoir "g," (made of vulcanized india-rubber,) which regulates the feeding and the branches connected with the gas-pipe.

The tube, K, receives the gas conveyed by the pipe "h," and conducts it to the valve, which opens and closes alternately, by means of a rod moved by an eccentric wheel fastened to the end of the shaft.

Two of Bunsen's piles, P, sufficient to produce the electricity are placed at a little distance from, and in communication with a Ruhmkorff electric apparatus, B. The electric current of this apparatus is conducted by means of insulated wires to the electricity distributor "m," placed on the front of the frame, while the current of electricity and its arrival at the inflammator, inserted at each end of the cylinder, is directed by the movement of the piston-rod, which, by an ingenious combination, impels a small movable slide before the distributor.

The burnt gas, after having performed its functions in the machine, escapes, by means of a valve, through a pipe, S, and the water designed to cool the interior of the cylinder enters by a double passage, by means of a pipe situated near the escape-valve, and goes out by the pipe, E.

A two and a half horse Engine has arrived from Paris and is now in practical operation at the brass cock manufactory of Mr. A. Carr's, *No.* 135 *Mercer Street, between Prince and Houston Streets, New York,* where those interested are invited to call and examine it.

THE LENOIR GAS ENGINE

Requires no Fire and makes no Smoke,

No Noise, no Dirt, and is thoroughly safe.

It is propelled by the expansion of Air, dilated by the combustion of Gas within the cylinder, ignited by the

ELECTRIC SPARK.

☞ *See full description on first page of this number.*